PHILOSOPHY OF MUSIC IN THE NEOPLATONIC TRADITION: THEORIES OF MUSIC AND HARMONY IN PROCLUS' COMMENTARIES ON PLATO'S *TIMAEUS* AND *REPUBLIC*

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Statement of authorship

I, Sebastian Francisco Moro Tornese, declare that the work presented within this thesis is my own.

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Abstract

My thesis examines philosophical questions about music according to Neoplatonism: what is music and what is the place of music in the structure of reality. I focus my examination of Neoplatonic music on the philosopher Proclus. For Proclus, music is something much richer than the phenomenon usually called music. My thesis studies this wide notion of music: music as art and as science, and furthermore music as a principle of order and harmony in the universe. Accordingly, music is intimately related to metaphysical principles: the World-Soul and the Intellect.

In Chapter I, I concentrate on the explanation of the mathematical proportions that are the basis for the musical scale of the *Timaeus* of Plato, according to Proclus' commentary on this dialogue. Secondly, in Chapters II and III, I study Proclus' metaphysical interpretation of the scale, understood as a symbol of the hierarchy of levels in Neoplatonism. In Chapter IV, I study what is the value of music for human life, in Proclus' commentary on the *Republic*. Neoplatonism is a philosophy of Unity, and in this context, music and harmony are a way of returning to Unity from multiplicity and division. I study how music can guide the human soul to come back to the origin of reality, with the help of musician gods such as Hermes, the Muses and Apollo.

My dissertation shows the connection between philosophy, mathematics, art and mythology. Music is a privileged art because it is related by an essential kinship to the soul. I have applied the Boethian classification of music to the inner logic of my thesis in order to show that in Neoplatonism all these aspects are organized in a complex conception of music. Neoplatonic music is consequently understood as an encompassing phenomenon, which mirrors the encompassing nature of Neoplatonic philosophy.

To my family

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Introduction

The principal aim of our study is to investigate Neoplatonic views on music, focusing on Proclus' philosophy of music. The word *mousikê* in the Platonic-Pythagorean conception inherited by Proclus, corresponds to a wide notion of music that encompasses the harmonious order of everything in the universe. Harmony in this sense is not only manifested as musical harmony but is present at all the different levels of the Neoplatonic hierarchy of reality. Harmony appears also as the continuity (*synecheia*) and link between those levels, which makes it possible for the soul to traverse back through the different stages that it has followed in its development from Unity. Since in Neoplatonism this development (procession) of the soul produces at the same time the world —and the soul is the main factor of unification of the multiple and the derived—, therefore the soul becomes the source of harmony for the sensible reality produced in the procession. We can also say that for Proclus there is harmony in the world because firstly the World-Soul is essentially a harmony.[1]

This notion of harmony is not only considered in a cosmological sense, it has also an application in the anthropological sphere, thanks to the kinship between the individual soul's harmony and the world's harmony. The microcosmic soul has its origin in the macrocosmic soul (Plato, *Philebus* 29).[2] For in this conception, the world is an ensouled being that has a cosmic Soul (*Timaeus* 27c – 30d), which we have referred to as source of harmony. Harmony is among the qualities of the Ideal or Paradigmatic level, and it is reflected in the sensible world; its importance resides in the fact that it is a principle of cohesion of the other qualities. For the Neoplatonists, harmony is one of the the signatures that the intelligible principles of unity stamp on everything in the manifested world.[3]

The Neoplatonists maintained a "Pythagorean" notion of music, which ascribes a celestial and ideal (divine) origin to music. This conception is found in Neoplatonism especially after Iamblichus who regarded Plato as a Pythagorean

[1] Proclus explains that there is no inconsistency between the *Timaeus*, where Plato maintains that the soul is a harmony and the *Phaedo* (92a – 95a), where he criticizes those who say this. Cf. *In Timaeum* II.126.14 ff.; II.161.12 ff and II.207.24.
[2] Cf. Coulter (1976), p. 97.
[3] Cf. Shaw (1995), p. 133 and 48 ff.

and emphasised that Plato's philosophy was a development of Pythagorean ideas.[4] The tradition of identifying Platonism and Pythagoreanism goes back to Plato's closest disciples, Speusippus and Xenocrates, and Proclus follows them in regarding Plato's *Timaeus* as a Pythagorean work.[5] Consequently, "Pythagorean" in this thesis means "Pythagoreanism as understood by Neoplatonic writers", unless we specify otherwise. Neoplatonic music is in this sense a revival of Pythagorean music, which is a much more complex phenomenon than the occurrence that we usually call music.

Plotinus, the founder of Neoplatonism, already expressed the Pythagorean conception of music (intelligible music) in the following words:

> The harmonies in sounds, too, the imperceptible ones which make the perceptible ones, make the soul conscious of beauty in the same way, showing the same thing in another medium. It is proper to sensible harmonies to be measured by numbers, not according to any and every sort of proportion but one which serves for the production of form so that it may dominate. (*Enn*. I.6.3.28, transl. Armstrong modified)[6]

In another passage of the *Enneads*, Plotinus considers how the natural tendency of the musician can be used to lead him from the sensible to the Intelligible:

> […] he must be led and taught to make abstraction of the material element in them [sounds and rhythms] and come to the principles from which their proportions and ordering forces derive and to the beauty which is in these principles, and learn that this was what excited him, the intelligible harmony (*noêtê harmonia*) and the beauty in it, and beauty universal, not just some particular beauty, and he must have the doctrines of philosophy implanted in him; by these he must be brought to firm confidence in what he possesses without knowing it. (*Enn*. I.3.1.28, transl. Armstrong)

Plotinus also links intelligible music with arithmetic and geometry, showing that the Neoplatonic approach to this kind of music is in the tradition of Plato's *Republic*, where harmony is presented as the object of the science of harmonics.

> For how could there be a musician who sees the harmony in the intelligible world and will not be stirred when he hears the harmony in sensible sounds? Or how could there be anyone skilled in geometry and numbers who will not be pleased when he sees symmetry, proportion and order with his eyes? (*Enn*. II. 9.16, transl. Armstrong modified)

Plato presented the four mathematical disciplines in his educational programme of *Republic* VII (525b ff.) as a propaedeutic to dialectics "modelled on the Pythagorean classification of science".[7] In this passage Plato follows Archytas

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[4] Cf. O'Meara (1989), pp. 94 and 30 ff. See (2005a) on the relation between Platonic and Pythagorean music.

[5] Cf. Burkert (1972), p. 65 and Kahn (2001), p. 64. On Proclus and the *Timaeus* as "Pythagorean" Physics, see O'Meara (1989), pp. 179 ff.

[6] Plotinus dealt with beauty in colours and the relation between light and fire in the preceding paragraph. Plotinus also followed Plato and the Pythagoreans in the metaphysical and symbolic doctrine of the harmony of the spheres, cf. *Enn*. IV.3.12; III.2.17; IV.4.8.54 and V.1.9.24.

[7] Cf. Barbera (1981), p. 401.

(fr.1) in saying that music (or harmonics) and astronomy are sister sciences.[8] Plato, while continuing a Pythagorean approach to Harmonics proper to Philolaus and Archytas in their theoretical and mathematical study of the musical intervals, returns to unresolved issues and makes clear that the value of the mathematical sciences resides in their capability of pointing to the Intelligible and criticises previous theoreticians of music for failing to take into account the dialectical and metaphysical value of music because they were directing their efforts to sensible music. This clarification is not necessary for the Neoplatonists, because for them Pythagorean thought is already perceived as a metaphysical philosophy based on Unity as the First Principle, where numbers correspond to Ideal numbers (principles of cosmic order) and musical ratios represent the Harmony of the Intelligible world.[9] For a Neoplatonist like Iamblichus the value of Pythagorean music resides in its *anamnetic* power because sensible music recalls a divine and heavenly music, and he does not consider the doctrine of *anamnêsis* (recollection) an invention of Plato; it is for him a traditional Pythagorean teaching.[10] Proclus also mentions the connection between mathematics and Platonic recollection and claims that both Plato and the Pythagoreans referred to metaphysical and theological doctrines by means of mathematically veiled forms.[11]

On the other hand, modern scholars emphasise the differences between early Pythagoreanism and Plato, and consider that a Pythagoreanization of Plato's philosophy took place only after Speusippus and Xenocrates. Burkert and Huffman argue that it is not possible that "mature philosophical ideas" such as Plato's could have been conceived by previous philosophers (including the Pythagoreans) and following Aristotle (*Met*. 990a4), they consider that the Pythagoreans did not distinguish between material and immaterial realities (or in Platonic terms: sensible and intelligible realities).[12] The Neoplatonists would not

[8] Cf. Huffman (2005), p.64.
[9] According to O'Meara, for Syrianus, "ideal numbers represent a Pythagorean way of speaking of Forms", O'Meara (1989), p. 135. This author explains the Neoplatonic point of view that the Pythagoreans expressed metaphysical doctrines by way of mathematical analogy.
[10] See Iamblichus' texts quoted below, pp. 211 ff.
[11] *In Eucl*. Prol. 21-22. Proclus also quotes the same passage of the *Phaedrus* (248d-250a) alluded to by Plotinus, *Enn.* II.9.16, cited above. Proclus explains that for the lover of beauty the organ of recollection is sight, for the musician hearing, because "the musician moves from harmonies that he hears to unheard harmonies and the ratios that exist among them" (transl. Morrow). For the philosopher, Proclus adds, mathematics is the awakening impulse towards genuine being and truth. Cf. Proclus, *In Timaeum*, II 246.4-9.
[12] Cf. Huffman (2005), pp. 58, 84, 237, 397, 424 and 591.

agree with this interpretation and would claim that the intelligible/sensible distinction was known before Plato.[13] Proclus says:

> Pythagoras transformed mathematical philosophy into a scheme of liberal education surveying its principles from the highest downwards and investigating its theorems in an immaterial and intellectual manner. (*In Eucl*. Prol. II. 65.16, tranls. Morrow)

Hence, from the Neoplatonic perspective, even if the object of Plato's critique in *Republic* 530c ff. was Archytas, for directing too much attention to the sensible world and the manifestation of music in this realm, one can suppose that Plato was doing this in order to be more faithful to Pythagoreanism.[14] We could also add that although Plato did not agree completely with Archytas in *Republic* VII, he did follow in the *Timaeus* the cosmic connotations of the diatonic scale of Philolaus, the favourite Pythagorean source for Proclus.[15] For Proclus then, both in Pythagoreanism and in Platonism we can distinguish a level of intelligible music and a level of sensible music (and intermediary levels).

In this context, Proclus' symbolic interpretations of numbers, ratios and musical structures are governed by his interest in showing that mathematical and musical considerations can awake in the soul an interest in metaphysical topics, because it is possible to contemplate the paradigms (the Intelligible principles) in their images (cf. *In Timaeum* II.246.4-9). Thus, Proclus is more interested in realities than in textual or literal details (nevertheless, he also studies the details in his commentaries). He comments a text because he wants to find some kind of truth expressed in them. When Proclus studies a text that mentions musical or mathematical problems, he considers the mathematical aspect of the dialogue with a deep insight and tries to explain it thoroughly; but at the same time he does it not for the sake of scientific or technical accuracy in itself, but because mathematics leads in an ascendant way to a higher reality.

In the Neoplatonic version of the Pythagorean/Platonic conception of harmony, the metaphysical (paradigmatic) level of harmony (a) is first reflected in (b) the level of mathematical music and this level in turn provides the model for (c)

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[13] For Plotinus (*Enn*.V.1.9.27), the school of Pythagoras and his followers insisted upon the orientation towards intelligible being and the One. O'Meara (1989), p.132, explains how Syrianus defended Pythagoreanism against Aristotelian criticism considering that "to all levels 'the Pythagoreans' applied mathematical terms, not because they were unable to distinguish between levels, but because of the relation of image to model linking each level to the level above it." Cf. Syrianus, *On Metaphysics*, 83, 14-26 and 180, 17-25; 186, 30-6.

[14] For a study of the passage on Harmonics in the *Republic* see Barker (2007), pp. 311 ff. and (1978). Cf. also Huffman (2005), pp. 57 ff. and 63 ff. and Barbera (1981).

[15] Cf. O'Meara (1989), p. 149.

cosmic music, which consecutively is reflected in human life (d). In the human domain *mousikê* is part of the holistic education and realization of a harmonious soul in a harmonious society.

The purpose of music is to manifest in sounds the inaudible harmony that belongs to the level of the Intelligible and the cosmos as a whole. Consequently, it has also at the same time the purpose to awake in the soul a desire and love for that harmony and beauty, elevating it through the different spheres of the Universe. Accordingly, music has a role to play in the pursuit of virtue, both at the personal level and in the society as whole, in terms of recuperation of a forgotten harmony and ascent to the intelligible harmony. The "Simile of the Line" and the way out or ascent from "the Cave" are two well known examples of the path that the soul needs to follow in its metaphysical journey of return to the Intelligible. These two analogies in the *Republic* are very important when considering the basis for the Neoplatonic hierarchy of levels, together with the analogy of the Sun (because the Sun represents in the sensible world the intelligible Sun or Apollo, source of harmony and rhythm in the cosmos). For us, embarked on the task of explaining the metaphysical meaning of music in Neoplatonism, it is essential to explore how these levels can be *navigated* in a musical way and expressed by means of a cosmic ladder that at the same time is analogous to a cosmic musical scale, according to Proclus' interpretation of the scale in Plato's *Timaeus*. The map of the harmony of the world corresponds to metaphysics and cosmology, the navigation of this reality to psychology and practical philosophy.

We intend to show how the Neoplatonists and Proclus in particular applied this "Pythagorean" notion of music and harmony in order to explain metaphysical problems such as the nature of the soul, the origin of the world as a whole and the relation between the different levels that compose it. Music as universal order — and beauty in general— does not mean a lifeless and merely formal conception without metaphysical content. Harmony and order in Neoplatonism are reflections of the richness of a higher spiritual reality (which is manifested as life and harmony). Proclus attempts to embrace in his theories the complexity and richness of the living universe, which is a manifestation of intelligible principles and the One, the ultimate Principle of Unity and Being in all things. His views on music help him to illustrate this complexity and express the harmonious continuity of the whole that proceeds from the absolute simplicity of the One, through the

intermediary ranks of Intellect and Soul. Proclus classifies music into different types in order to show that the process of manifestation of different levels of music mirrors the metaphysical process of manifestation from the One to the sensible world where audible music exists. There is music at the physical level (sensible music), music at the mathematical level (music at the psychological level) and music at the metaphysical level.[16]

The highest level of music can be described as "intelligible music" and is the most comprehensive because it includes the causes of all the subsequent manifestations of music. The following levels can be seen as the product of a derivation by way of reflection of a paradigmatic harmony. This conception can be found in Proclus' *Commentary on the Timaeus*, for instance:

> How, therefore, does the soul participate in reasoning and harmony? And how is it that harmony and reasoning are not in it in the primary mode, but in a participatory mode? I say it is because these – viz. reasoning and harmony – have pre-existed in the Demiurge, for he has also created the Muses and the Leader of the Muses and the series of Hermes. Therefore in him you find the demiurgic reasoning and the harmony that exists in the primary mode, the one belonging to the order of Hermes, the other to the order of Apollo. It is as a result of these that the soul which has been filled with them participates in reasoning and harmony. And, if it is necessary to say expressly what seems to me to be the case, it is that intelligible harmony is manifested in a three-fold way. First there is Harmony Itself. Then there is that which has been harmonised in the primary manner and is this way throughout the whole of itself. Third, there is that which has been harmonised in a secondary manner and participates in a way in harmony. One must refer the first to Intellect, the second to the Soul, and the third to the Body. (*In Timaeum* II. 294. 27, transl. Baltzly with some changes)[17]

This characterization of harmony is an application of a general principle stated by Proclus in his *Elements of Theology*:

> Every soul is all things, the things of sense after the manner of an exemplar and the intelligible things after the manner of an image. (Prop. 195, transl. Dodds)

Proclus is referring here to the intermediary position of the Soul, which is an important point for the understanding of the essence of music.[18] The first manifestation of harmony is the intelligible Harmony in itself, after this, the first

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[16] On the tripartite division of reality in Neoplatonism see Merlan (1968), especially I. "Soul and Mathematicals" and III. "The Subdivisions of Theoretical Philosophy". The tripartite distinction here relates to the fourfold distinction on pp.11-12 above, because the manifestation of music in the sensible world can be divided in macrocosmic and microcosmic music. The metaphysical level is supracosmic, while the level of World-Soul is intermediate: it is present in the cosmos as its guiding and harmonizing principle but it has at the same time an eternal aspect which makes it supracosmic. The level of the World-Soul corresponds to the mathematical level, as we shall see below, p.36 ff.

[17] From now on Proclus' *Commentary on the Timaeus* (*In Timaeum*) will be cited according to the Tarrant (Book 1)-Runia and Share (Book 2)-Baltzly (Book 3) translations (Cambridge, 2007-09). In some instances the translations have been modified, after comparing them with the original Greek and with Thomas Taylor's English and Festugière's French translations as well.

[18] Cf. also Proclus, *In Timaeum* II.126.10.

harmonized reality is the Soul, composed after the paradigm of the Intellect (in this sense it is an image of that ideal Harmony).[19] At the same time, although this harmony *in the Soul* is a secondary manifestation, it still belongs to a spiritual whole on the grounds that the Soul mirrors the intelligible Harmony and is connected to it in its circulation around the Intellect. The sensible world, on the other hand, receives harmony only through the intermediary of the Soul, which is its paradigm and transmits to this level the participation in the Intelligible. The sensible world is then a manifestation of harmony and unity in the realm of partial and divided realities and the paradigms of its order come from the Intellect by way of the Soul.

The paradigms of harmony and arrangement of the world are Ideas, Numbers and musical Scales.[20] Every musician knows that there are paradigms of musical notes and scales, and if he does not play the notes in the correct way on his instrument, then a disparity between the played note and the real note (that is a mistaken or out of tune note) results. In Ancient Greece the model of a musician was Apollo playing his lyre. In the same way that Apollo as an archer does not miss the target, when playing he does not miss the intelligible melody. Apollo, like Orpheus, another paradigmatic musician, played music in an ideal way. Proclus mentions (*In Timaeum* II. 294.24 ff.) that the primordial harmony belongs to the Apollonian chain. The music of Apollo and the Muses corresponds to intelligible Harmony. From the same point of view, Proclus states, Reasoning corresponds to the Hermaic chain.[21] Harmony and Reasoning pre-exist in the Demiurge, and for this reason the World-Soul, Proclus explains, participates in reason and harmony.[22]

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[19] The notion of paradigmatic or archetypal harmony is present in Philo of Alexandria (*Opif.* 78) who uses similar expressions: *tên archtypon kai alêthê kai paradeigmatikên mousikên*. According to David T. Runia (1986), p. 272, this notion of paradigmatic music is adapted from Plato's *Timaeus* 47 d. See also Runia's commentary on his translation of Philo (*Opif.* 78) (2001), p.251.

[20] In Plato's *Timaeus* 35c ff. the musical intervals of fifth and fourth, etc. are paradigms of order for the creation of the Soul and the World.

[21] What Proclus means by the Apollonian and Hermaic "chains" will be explained later on pp. 19-20. The word *seira* means in this context basically a chain of participation linked to a particular god or "Henad" and their distinctive divine qualities. Cf. *El. Theol.* Prop.97 and Van den Berg (2001), p. 167.

[22] Reason and harmony are not present in the Soul in the primary mode (*prôtôs*) but according to participation (*kata methexin*); the primary mode belongs to the *Nous*. Cf. Baltzly's English translation of this passage, *In Timaeum* Vol.IV, (2009) , p.250.

Accordingly, the various kinds of music derive from a universal and spiritual type of music that can be considered divine and related to Apollo and the Muses.[23]

One question that the Neoplatonists need to deal with is how music descends from the higher levels of Apollonian music to the manifestations of music in the sensible world. From the cosmological point of view the derivation of music from its principles is understood in Neoplatonic terms as a "procession" from the One. From the point of view of poetics or aesthetics that studies the different levels of music as an art and in relation to human education, the derivation is explained as an "inspiration" of the Muses. In both cases music and harmony show the uninterrupted connection (cf. Proclus, *In Remp*. I. 178.20) between the derived realities and the universal principles, a continuity (*synecheia*) that can be symbolized in the vertical line that a musical scale follows up and down. The descending direction corresponds to divine inspiration, which is correlated to an ascending force of aspiration towards the divine.

Music is present both in the descending direction of cosmic illumination and inspiration and in the ascending aspiration to recover the divine source of harmony. These two aspects of music (the cosmological and the educational/therapeutic) are considered by Proclus in the context of the *Timaeus* and the *Republic*. In the *Timaeus* (35c), harmony is the result of the activity of the creative Intellect personified as the Demiurge, who is depicted by Plato as "poet and father".[24] This dialogue depicts how the Demiurge creates the World and a World-Soul according to musical proportions. On the other hand, in the *Republic*, harmony in society is the result of a good political organization with a corresponding educational program that regulates *mousikê* in order to make it a reflection of the cosmic *mousikê* and that produces, ideally, citizens that are open to the reception of harmony. From Proclus' point of view, the relation between the *Timaeus* and the *Republic*[25] is based on the fact that the true politician has the aim of creating an ideal state, and in this way works in the same manner as the Demiurge that creates the world having an ideal model in view.

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[23] Cf. Proclus, *In Remp*., I.57.8 ff.; I.193.18; II.4.15 and *In Cratylum* 101-102; 174. 58 ff. and 176.77 ff. Cf. also Moutsopoulos (2004), pp. 203 ff.

[24] The Demiurge is called "*poiêtês kai patêr*" by Plato in the *Timaeus* (28c 3, cf. 41a 7 and *Statesman* 273b 1); cf. Proclus, *In Timaeum* I. 311.26 ff. "Father" emphasises the aspect that corresponds to the source of life and relates to the fact that the world is a living being, copy of a living intelligible model (Cf. Proclus, *In Timaeum* I. 299.21 ff.). This aspect also associates the Demiurge with Zeus, who traditionally is the Father of gods and men (Cf. Proclus, *In Timaeum* I. 315.4-317.20).

[25] The *Timaeus* is presented by Plato as a continuation of the conversation narrated in the *Republic*.

The politician must know about *mousikê* because it is not possible to create a city without proportions and harmony and in this way the politician works together with the poet/musician. At the same time, these two mirror in their activity the collaboration that in the cosmos is achieved by the divine statesman, Zeus, and the divine poet/musician, Apollo.[26]

The passage from the cosmological to the human (aesthetics/education and politics) can be carried out because the same life that animates man animates the cosmos; the universe is said to be a living being in the *Timaeus* and the Demiurge is called "father", as we have seen. The life of the universe comes from the Intelligible realm, which is the model of the arrangement of the world: the "Living Being Itself" (Plato, *Timaeus*, 30c 4). Since the model of the order of the universe is a complete ideal living being, the notion of harmony, which keeps the manifestation joined together, is linked to the notion of life in Neoplatonism. In this conception, the universe is not a mechanism; it is endowed with life and this quality comes to it from the First Principle directly, because the One-Good is the principle of existence (*hyparxis*) according to Proclus (and for this reason the "paternal" causes that give life imitate it). According to this, and because the One transcends both the Intellect and the Demiurge, the return of the soul and the corresponding Platonic education presuppose two aspects: one is the education of reason but the other, and very important, is "love", that inspires in the soul the desire to ascend to the One and to spiritual Beauty.

On the one hand, Love is infinite and is a unitive aspiration towards the One (Cf. Plotinus, *Enn*. III.5.7). On the other hand, the Intellect is the principle of determination and giver of being (everything is what it is, in imitation of an Idea that is its model); this aspect of causality is called "demiurgic" (and corresponds to the first part of the appellation "maker and father").[27] Music is important for Proclus and Iamblichus because it shows in itself the formal aspect of order according to paradigms, but at the same time it is capable of expressing a likeness with the invisible life that holds together different things (that are different *after* the formal determinations). Music shows this essential "quality", which is

[26] Cf. Proclus, *In Remp.* I. 68.3-69.19; *In Timaeum* II. 3.7.

[27] For Proclus the order of the words "maker and father" in Plato's depiction of the Demiurge has a meaning (cf. *In Timaeum* I. 299.21-300.13 and I. 311.25 ff.). The Demiurge is first a cause that acts according to a formal model (the Forms or Ideas), like an artistic maker, and afterwards is a father, himself imitating in turn the One and the paternal causes. Cf. Props. 151 and 157 in Proclus' *El.Theol*.

previous to determination, being a non-discursive language that expresses in its continuous harmony the simplicity of the "life" originated from the One. In the case of the First Principle it is a question of a "life" that is more than life and more than existence because it is the source that transcends these determinations as well. Strictly speaking life corresponds to the Intellect, and the intelligible harmony corresponds to that life, especially in its aspect as the source of harmonious procession.[28] Manifested music, on the other hand, belongs to the level of soul and discursive thought; nevertheless there is a presence of the non-discursive in it, through illumination, inspiration, analogy and evocation, as we are going to see in the following chapters.

We will see later that the principle of intelligible Life was considered analogous to the Tetrad, while the model of the order of the universe (determined according to Ideas and divine Numbers) corresponded to the Decad and the Demiurge. For the moment it is important to have in mind that according to Pythagoreanism the Tetrad is both a source of life and nature (*pagan aenaou physeôs*) and the model of harmony because it contains the main musical intervals, as we shall explain later with more detail when explaining the Pythagorean *tetraktys*.[29]

The life of the cosmos has its origin in this "fount of ever flowing nature", which is continuous and cohesive: for that reason the universe imitates the One in the fact that it is a whole that has a unitary life.[30] This life guarantees the continuity of the different parts in a universal "sympathy", which is possible because for the Neoplatonists there is no gap in nature.[31] As Proclus states:

> […] the Good is what produces everything and makes everything return to it again. It is necessary then that the product resemble the producer. Since the Creator of the world is one (*henos*), necessarily the creation has to be continuous, because continuity is akin to Unity. The reason for this continuity is the likeness between the latter segments of the line to the preceding segments. (*In Remp.* I. 288.11-16)[32]

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[28] On the notion of life in Proclus, see Siorvanes (1996), p. 158-159 ; 164. Moutsopoulos (2004), p. 206, refers to the relation between music and the vital (*zôtikê*) harmomy that organizes the universe, the soul and the artistic activity done in conformity with that intelligible music. He quotes Proclus, *In Timaeum* II.195.15-17.

[29] On the *Tetraktys* see Burkert (1972), pp.72 ff. and 186 ff.

[30] In mathematical terms, the number one (that orginates the four numbers of the tetraktys,1+2+3+4 =10) is the source of the harmony represented by the relations between these four numbers.

[31] *Natura non facit saltus*. Cf. Leibniz, *New Essays on Human Understanding*, IV,16. (*Nouveaux Essais sur l'entendement humain*/Préface, 1704, ed. Boutroux, Paris, 1886, p.135.) and Linnaeus, *Philosophia Botanica* (Stockholm, 1751, p. 27 sect. 77).

[32] My translation according to Festugière's French. In what follows I have used Festugière's translation as a guide for all the references to Proclus' *In Rempublicam*.

Proclus mentions "segments" because he is commenting on the Simile of the Divided Line in the *Republic*. Proclus and other Neoplatonists associated the following ideas: likeness, continuity, proportion, harmony, sympathy, etc. All these notions express the causes that unify multiplicity and the opposites, and make the derived realities connected to their principles. Proclus continues explaining (I. 288.29) that all the fragments of the line are joined by the "most beautiful of bonds" (quoting Plato's *Timaeus* 31c 2) which is "proportion" (*analogia*). The proportion that unifies everything in an "indissoluble friendship" (*In Remp.* I. 289.4), is what appears explicitly in the *Timaeus* as the musical proportion that makes all levels concordant one to another.

The musical metaphor is a very appropriate one, because the line of the *Republic*, when compared to a musical string, is able to show how the different parts are connected in a single vibrating structure that produces the different notes. Musical strings contain the notes in their physical structure, and according to the ratios and proportions manifested in their vibrations (made possible by their flexible nature), the notes that are in the latter part are joined together in a harmonious structure to the notes that belong to the preceding part. In this context, cosmic sympathy can be seen in the phenomenon of vibrating strings, which was a phenomenon discussed by Plotinus when he says that in the Universe

> one part is in sympathetic connection with another, just as in one tense string; for if the string is plucked at the lower end, it has a vibration at the upper. But often, too, when one string is plucked another has a kind of sense of this by its concord and the fact that it is tuned to the same scale. But if the vibration can even pass from one lyre to another in so far as a *sympathy* exists, then there is also one single harmony in the All, even if it is composed of opposites; and it is in fact composed of parts which are alike and all akin, even when they are opposites. (*Enn.* IV.4.41, transl. Armstrong)[33]

The metaphor of the strings that sound together "in sympathy" expresses the invisible continuity that connects everything in the universe.[34]

The notion of "sympathy" was a technical term of music and it was subsequently applied to the universe in a doctrine of cosmic music that expresses the consonance and participation in vibratory rhythm between things that are apparently not connected, but are intrinsically linked by an inner harmony, in the same way that different notes belong to a musical scale or melodic phrase. In the case of the human soul, we are told by Plato in his *Timaeus* (41d ff. and 43d ff.)

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[33] Cf. Plotinus, *Enn.* IV.4.8.56, for another reference to cosmic sympathy and music.

[34] Cf. Theon of Smyrna, *Expositio rerum mathematicarum ad legendum Platonem utilium*, Hiller 51, 2 etc. Cf. also Anne Sheppard (1980) on the notion of sympathy in Proclus, especially Ch. 4: "Allegory, Symbols and Mysteries", pp. 152 ff. and Siorvanes (1996), pp.64 ff.

that its nature is harmonic and akin to the World-Soul; although that affinity can be forgotten or concealed, music is precisely the discipline which awakens again the congeniality with harmony because, as Proclus says, following Plato's programme of education in the *Republic*:

> music allegedly puts the soul in sympathy with beauty and makes it shrink away from the ugly (*In Remp.* I.54.24).

The relation between the metaphysical/cosmological and the human/aesthetic can also be explained in relation to the notion of sympathy. The famous comparison of Plato's *Ion* (533 d 5) between the effect of the inspiration of the Muse and the unifying power of the magnet that runs across the different links of a chain is interpreted by Proclus (*In Remp.* I. 182.21 ff.) as an example of the unification that joins different metaphysical levels.[35] This is another example of cosmic sympathy, which is mirrored in the human level of poetics and sacred art that connects the human and the divine.

Taking into account the different perspectives mentioned above, we are going to structure our study in the following way: in the first three chapters we shall explore the relation between music and Pythagorean mathematics in order to present the musical scale of the *Timaeus* (Chapter I) and music as cosmic harmony, together with the metaphysical and symbolic connotations of music, according to Proclus' *Commentary on the Timaeus* (Chapters II-III). In Chapter IV, we will investigate educational music—and music as a therapy for the soul—in relation to poetics and human life in Proclus' *Commentary on the Republic*. All these aspects are interconnected in Proclus' philosophy: inspiration is a kind of divine grace understood as "illumination" (*In Remp*. I. 184.24 and 185.5) that descends from the One as ultimate source, through Apollo and the Muses. The cosmogonic process is also the result of another kind of illumination. The Neoplatonists, following Plato's "Simile of the Sun" in the *Republic* (507b – 509c), understand procession in terms of "emanation" of light (*perilampsis*) from

[35] Proclus applies to aesthetics metaphysical notions such as "moved by other"; "moved and moving" (proper to the intermediary); "self-moved" and "first mover" (*In Remp*. I. 183.27 ff.). The chain that appears in Plato's *Ion* in the example of the magnet can be related to another symbol: that of the *golden chain* of Zeus, according to Homer's famous metaphor in *Il.*VIII.19 (cf. Proclus, *In Timaeum* I. 314.17 and II. 24.28). Cf. P. Lévêque (1959). For Neoplatonism the concept of chain and series is a fundamental one to understand the notion of participation.

the One. Since this process is an irradiation of Unity, it produces a stream of life that expresses itself in proportion and harmony.[36]

On one side we have the *musical procession* that corresponds to the "creation" of the world, in which "harmony" is a basic principle of order, which for Proclus depends on the gods: Apollo, the Muses, Hermes, Athena, Hephaistos, etc. and the Demiurge, identified with Zeus in the context of the *Timaeus*. On the other side, the stream of harmony that emanates from the intelligible Harmony is considered a "divine inspiration" or breath (*theian epipnoian anôthen*)[37] of the Muses, studied by Proclus in the context of other Platonic dialogues, such as the *Phaedrus*, the *Ion* and the *Republic*, etc.[38]

The structure of this study therefore follows the order of the metaphysical moments of the cycle "procession" and "return" in Neoplatonism; the first chapters depict the descent of harmony from the principles, while in Chapter IV we explain how this cosmic influence reaches further into the human world, through education, music as sacred art and poetry which make possible the return of the human soul through the same steps that the descending inspiration has followed.

We follow the Boethian division of *musica mundana* and *musica humana* as well, arranging the order of chapters starting from the former and leading to the latter, until attaining the third type of music according to Boethius, *musica instrumentalis*, which corresponds to the audible music of the sensible world, which points to the higher levels through its symbolism and meaning.

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[36] "Light" is in this context primarily a spiritual reality because although an aspect of it comes from the Sun, it is considered as originally coming from an intelligible operation of the Intellect, that mirrors the One-Good, which was compared by Plato with the visible Sun. Cf. the different levels of light or "Suns" in Julian *Oratio* IV, 'To Helios the King', 134 b (and 139 b – 141 d), a passage which is believed to have been inspired by Iamblichus. Proclus says in many passages of the *In Timaeum* (e.g. II.102.10 ff.; II.143.10-15; II. 284.5) that the creative activity of the Demiurge that produces the harmony of the World-Soul and of the body of the Universe is a kind of "illumination". To produce harmony and to illuminate are equivalent expressions in Proclus' Neoplatonic language, and this is probably due to the fact that Apollo is both the god of the Sun and the primordial cause of harmony and music. For the language of light and illumination applied to music and harmony, cf. Proclus' *Hymns* to Helios and to the Muses.

[37] *In Remp.* I.184.7.

[38] Iamblichus expresses the relation between harmony and inspiration in this way: "the inspiration of the Gods is not separate from the divine harmony, and since it has been adapted to it from the beginning, it is participated by it in the appropriate measures", *De myst*. 119, 9-15, translated and commented by Gregory Shaw (1995), p.175. Iamblichus explains that the inspiration of music is not only the result of a sympathy between body and soul, but is due rather to a previous and more original adaptation between the nature of the soul and the divine harmony through the agency of the gods, which is awakened according to the connection of the different levels of the universe.

Since all levels are interrelated and there is return at the macrocosmic level too, we shall mention the notion of return already in the first chapters. Although the return is particularly pertinent to the microcosm and the destiny of the human soul it is also present in the Intelligible realm and in the macrocosm.[39] As Dillon points out:

> The reversion of an entity, or level of being, both on itself and on its 'higher' cause is the basic mechanism binding the various levels of existence together.[40]

Harmony is another name for this "mechanism of binding" that guarantees the continuity between the levels. The particular virtue of the notion of harmony, which is a better term than "mechanism," is precisely that it is able to express a living unity rather than a mechanical one. We are going to study in what way music contributes to the understanding of this metaphysical-cosmogonic theory. Symbolism is another way of expressing the continuity of life between the higher and secondary levels. In the same sense, *musica instrumentalis* appears in the context of Neoplatonic doctrines that claim that musical instruments can symbolize the nature of the soul and the universe.[41] Aristides Quintilianus, Theon of Smyrna, Nicomachus, Boethius, all of these authors, considered that sensible or audible music is a reflection of mathematical and intelligible music.[42] And it serves in the Pythagorean tradition as *anamnêsis* of intelligible Harmony (and of the harmony of the spheres, which is another holistic music as well). To detail the totality of correspondences and analogies in the symbolism of musical instruments is beyond the scope of this work; however we will examine *musica instrumentalis*

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[39] The categories of "remaining, procession and return" (*monê, prohodos, epistrophê*) correspond to a cosmogonic process but they are also metaphysical notions. Cf. Dillon (1997), p. 377.

[40] Dillon, *ibid*., p. 369.

[41] This has to be understood in the context of Neoplatonic "theurgy", where material objects are symbols of spiritual realities, and for this reason, are able to open a connection between both levels. Proclus studies this topic in his short work "*On the Hieratic Art*". Cf. Gregory Shaw, (1995), ch. 2, "Matter as Cosmic Instrument" and chapter 16, "Intermediate *Sunthêmata*: Seeing and Hearing the Gods" (pp. 174-175 in particular). Instrumental music, like all types of audible music, is the occasion of "*anamnêsis*" for the soul, which helps it to remember the inaudible music of the Intelligible.

[42] Nicomachus of Gerasa (2nd century A.D., Neopythagorean writer) was a great influence on Iamblichus and Proclus. On his relation to Neoplatonism see, O'Meara (1989), p. 14 ff. Theon of Smyrna (2nd century A.D. Platonist) wrote an introduction to Plato called *Mathematics Useful for reading Plato* where he studied the relations between arithmetics, harmonics and the order of the universe, and was very influential as well on Neoplatonism. For an introduction to these two authors see Dillon (1977), pp. 352 and 397 ff. Cf. also Barker (1989), pp. 209 ff. and 245 ff. On Aristides Quintilianus' Neoplatonism (3rd century A.D.) see Mathiesen (1999), pp. 523 and Barker (1989) pp. 392 ff. See note 327 below on Boethius' Neoplatonism (5th century) and Bower translation of his *De Institutione Musica* (1989), p. XXVIII for a study on Boethius sources, including Nicomachus as one of the main sources; cf. also Bower (1978).

as an audible reflection of macrocosmic divine numbers, expressed in the numerical proportions of the strings and tubes, etc.

Accordingly we shall deal in the first chapters with the metaphysical and cosmological aspects of cosmic music (*musica mundana*), and its projection at the level of the World-Soul and its harmonic relation with the body of the universe. This relation between the World-Soul and the sensible world is in turn the model of the relation between the particular soul and the body, which will be studied according to *musica humana* in Chapter IV. In this way, the analogical character of music in Neoplatonism, capable of showing the microcosmic reflection of the macrocosm will be better understood. At the same time, since music comes from metacosmic levels, we shall refer to the Apollonian music, which according to Proclus is established in Unity, therefore transcending the macrocosm-microcosm mirror-like reflection. Music in this transcendent level appears as a mirror of Unity itself, achieving the highest level of harmony in its union with the One.

A complete account of Pythagorean musical theory and its influence on Plato's description of the generation of the musical scale of the *Timaeus* would require extended treatment beyond the scope of this study.[43] Nevertheless, we shall try to explain in Chapter I the mathematical foundation of the *Timaeus* scale according to Pythagorean theory, and at the same time to point out its philosophical meaning (which will be treated under different aspects in the following chapters). The philosophical meaning of mathematics and music is another feature of Pythagoreanism, because for this school mathematical "language", i.e. numbers, geometrical figures and musical intervals, etc., expresses through symbols a higher divine reality and the metaphysical principles of the visible and audible cosmos.

Proclus explains why Plato, following the Orphic and Pythagorean tradition, used the symbolic language of mathematics:

> But doubtless Plato secretly used mathematical terminology like a veil (*parapetasma*, *Prot.* 316e) for the truth of things, just as the [Orphic] Theologians used myths and the Pythagoreans used symbols. For it is possible to contemplate the paradigms in the images and it is possible to make the transition to the paradigms through the images. (*In Timaeum* II 246.4 – 9).

[43] See the Bibliography for specialized studies on Pythagorean music theory: West (1992), Barker (1989 and 2007), Mathiesen (1999), etc. Huffman (1993) also includes an interesting summary of music theory in his section on Philolaus' musical fragments and Huffman (2005) studies Archytas views on music.

We have already mentioned that Neoplatonic music is a revival of Pythagorean music.[44] This kind of music plays a very important role in the account of the creation of the world in the *Timaeus*. Plato's mythical description of the composition of the World-Soul places a kind of "generation" in the Intelligible world, or more specifically at the psychological level.[45] According to Proclus' exegesis of Plato's account of the generation of the Soul, which includes both mathematical and mythical aspects,[46] music is necessary because it is understood as the principle of harmony that unifies Sameness and Difference, "which are analogous to Limit and Unlimitedness respectively" (*In Tim*. II.133.29). [47]

"Odd" and "even" and *peras* (Limit) and *apeiron* (Unlimited) are the basic principles of Pythagorean cosmology (see Philolaus, frs. 1,2,6)[48] They are the elements of number and the source of the two geometrical progressions in the *Timaeus* (cf. Plato's *Tim.* 35b ff.).

In Pythagoreanism, the generation of numbers was explained as a derivation from Unity; in Neoplatonism "procession" takes the place of "derivation".[49] However, in the *Timaeus*, the language is purposely "Pythagorean", used to depict a cosmological explanation that includes a combination of the four branches of mathematics (arithmetic, geometry, music and astronomy); consequently in the Neoplatonic commentaries the language of derivation is combined with the metaphor of procession. Music or harmony is presented as one of the stages of this derivation-procession that is at the same time a cosmogony.

The nature of the World-Soul is intimately linked with the nature of the objects of mathematics, and in the same way that the mathematicals derive from the

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[44] Cf. O'Meara (2005a), p. 131.

[45] "Psychological" refers here to everything "proper to the study of the soul" and not the modern discipline. Jean Trouillard has pointed out that the Neoplatonic interpretation of this problem is that strictly speaking there is "procession" in the Intelligible world (eternal beings: i.e. minds and the substances of souls) and everything else falls under "genesis" or "coming into being". At the same time "procession" is in Neoplatonism a continuous process from the One to matter, containing only one "generation" or "production" of everything. See Jean Trouillard (1981), pp. 4 and 10.

[46] The Neoplatonists interpreted "generation" in a symbolic and metaphysical way and not in temporal terms.

[47] Proclus combines Plato's *Sophist* 250a, 254b, *Parmenides*, 129e, and *Philebus* 16c-d (cf. Plotinus, *Enn*.V.1.4.34) in his exegesis of this passage of the *Timaeus*. Cf. also *Philebus* 17a-e on the musical connotations of Plato's limit and unlimited.

[48] Cf. Burkert, p. 32 ff and 433 ff. (related to male/female). Cf. also p. 51 where this author studies the Pythagorean "table of opposites" (Arist. 986a22) and Huffman (1993), p. 182 ff. Proclus says that anything that exists results from Limit and Unlimited and connects rest and motion respectively to this pair of principles . (*In Tim*. II.133.30-134.20). See note 52 below.

[49] Cf.Trouillard (1981), pp.1 and 9.

intelligibles, the Soul as a whole proceeds from the Intellect.[50] We will try to show how this derivation is represented, according to Proclus and Iamblichus, in the musical scale of the *Timaeus*, in the fact that the whole scale (as a straight line = procession) derives from a first "portion" or "monad" and also because it is a harmony of Limit and Unlimitedness, as the result of proportions that contain even and odd numbers (that correspond to these two categories). Through the odd numbers and Limit the Soul receives *synthemata* (symbols) of its return to the Principles (in a circular way = conversion).[51]

A notion of "musical procession" is possible in Neoplatonism because: if a) mathematical derivation is one example of metaphysical procession, and b) music is one of the mathematical sciences, then c) music portrays in some way the procession of the Universe.[52]

In this context, the Neoplatonic procession of music is included in the derivation of the mathematical sciences: the question "how does music derive from arithmetic?" is coherent with the treatment of how the musical intervals are based on numbers and mathematical proportions. Accordingly, the Pythagorean science of Harmonics included the study of numerical ratios. Nevertheless, Pythagorean music, like Neoplatonic music, is not restricted to mathematics and numbers; mathematics is a symbol or allegorical language used for expressing metaphysical and cosmological notions. This is possible because Pythagorean numbers are qualitative principles and not mere quantitative numbers.

Proclus makes clear (*In Timaeum* II.174.15 ff.) that mathematical speculation (*mathêmatikê theoria*) is not the only method of explanation of the text of Plato and the musical scale in the *Timaeus*. He recognizes its importance but at the same time advises us to complement it with another kind of explanation, which corresponds to the elucidation of the reality of things in themselves (*tôn pragmatôn ousia*). The character of Timaeus says that he is presenting a likely account based on likeness due to the limitations of the human nature (*Timaeus* 29b). Proclus understands that this likeness is presented in mathematical form (the

[50] Cf. Merlan (1968), p. 12.
[51] Cf. Proclus, *In Timaeum* II. 247. 28 ff., especially 248.10 ff.
[52] In Proclus, the metaphysical procession from the One contains in the highest phases the first pair of principles after the One, Limit and Unlimitedness. These principles are not only the principles of mathematical being, but of all manifested reality; they are not only cosmic principles but also the principles of the whole level of Being that corresponds to the hypostasis of *Nous* in Neoplatonism. Cf. Proclus, *Elements of Theology*, Prop. 87 ff.; Section J. pp.81 ff. in Dodds' translation and *Platonic Theology*, III.9. See also Anne Sheppard (1982).

mathematical realities are a reflection of Intelligible realities), and prepares the human reason to ascend towards the intuitive character of Intellect (cf. *In Tim*. II 246.4-9). His method follows Plato's recommendation of presenting likeness and images, which should not be scorned because they allow us to see the Intelligible realities (*ta pragmata*) in their sensible and mathematical manifestations.[53] However, as Proclus adds, to study the mathematical theory for its own sake makes the exegesis of the text unstable and disconnected from the essential principles.

Since mathematical sciences correspond to an intermediate reality between the sensible and the Intelligible, they are appropriate for showing in themselves a purer image of the Intelligible, but afterwards the explanation has to transcend the "scientific" level of mathematics and lead to an allegorical philosophical (metaphysical) level where the explanations are anchored (*hormein*).

Proclus says (*In Timaeum* II.195.10-24) that the study of "the essence of the soul" corresponds to the essence (*ousia*) of the soul itself and ascends from the manifested harmony to the substantive (*ousiôdês*) and immaterial harmony.

For this reason Proclus structures his explanation according to two aspects that are always interconnected: the mathematical-musical explanation of the musical intervals and the scale (*In Timaeum*, II.174.15-193.6), and a metaphysical allegorical reading of the numbers and proportions that are the foundation of the scale (II.193.7-237.7).

We will follow the same framework and explain in Chapter I the musical scale according to the Pythagorean theory (the Pythagoreans were, according to Proclus, the discoverers of the proportions of the musical canon, *In Timaeum*, II.174.24) and we will study later, in Chapters II and III, Proclus' account of the scale in regard to the intelligible principles. However, it is not an easy task to separate the mathematical and the intended symbolic meaning, which was present already in the Pythagorean tradition, in Plato and in the Neoplatonic reading of these texts. Our methodology therefore corresponds to an exegesis on different levels at the same time.

Proclus' metaphysical explanation of the numbers and the scale of the *Timaeus* follows, as Festugière remarks, the Neopythagorean arithmological speculations proper to the works of Nicomachus of Gerasa, such as his *Theologoumena*

[53] Festugière clarifies in his translation of this passage (p.219, Vol.III) that "*ta pragmata*" refers to the true reality of the intelligible level and that the images correspond to the sensible world.

Arithmeticae, which was extensively commented on by Iamblichus in his *On Pythagoreanism* where he deals with the metaphysical, physical and ethical implications of numbers.[54]

In this context the derived levels of mathematics and music are reflections of a higher reality and are the result of the ordering activity of the Demiurge. Mathematical being belongs to an intermediary level, which contains also the science of Harmonics (*harmonikê*) which is the study of musical ratios, the regulation of sounds according to mathematical proportions. In this sense, mathematics belongs to the level of Soul which is the principle that joins the Intelligible with the sensible, as we have mentioned. Accordingly, the mathematical aspect of music can be studied in itself or in relation to the universe, because for example the orbits of the planets are arranged according to harmonic proportions, the seasons of the year, the elements, etc. All these correspondences are not only cosmic, but are as well expressions of ideal qualities and principles, a fact that points to a metaphysical explanation of music, that I shall present according to Iamblichus and Proclus after studying the level of cosmic music in Plato's *Timaeus*, which is the base for the Neoplatonic reflections on music. Proclus studies this type of music especially in relation to Plato's *Timaeus*, because this work is a cosmological dialogue that presents, in Proclus' interpretation, Pythagorean doctrines.

In summary, since the cosmological process or the generation of the material world imitates in some way the "procession" and "return" of the Intelligible world, we shall deal with the procession and return of music, following in our order of exposition these two phases of the metaphysical movement of reality. Harmony appears (proceeds) in the Universe as a whole and produces a return in the sense of making a likeness to the original intelligible Harmony. Although there is a "return" in this cosmological sense, we will investigate the notion of "return" in Chapter IV in relation to human music and how it assists the soul in its return (ascent) to the Intelligible.

The composition of the world, treated in Chapters I and II, is a production or progression of the different levels of reality from intelligible principles and the One, and in this sense corresponds to "procession". This can be seen as a

[54] Cf. Festugière's French translation of the *In Timaeum*, note 1, p. 240, Vol III. Many of the arithmological comments of Proclus in this section come from Iamblichus' lost commentary on the *Timaeus*. On Iamblichus' overall plan of the *On Pythagoreanism*, cf. O'Meara (1989), pp. 32 ff.

descending path and a way of manifestation from principles that are un-manifested. Music in the *Timaeus* is considered with respect to a *descending* scale that expresses the essence of the World-Soul, which is in turn the *Logos*, the expression, the "language" (including musical language) of the inner principle of Intellect (*Nous*), which is not manifested, and silent because it corresponds to something that is more than music. It is "silent" in relation to a super-abundance of music and harmony. At the other extreme of the scale the material realm is silent because of a lack of music: in the middle there is Soul, the source of music for the whole universe, and the principle that transmits music and harmony to the sensible world, that otherwise would be a place deprived of light and order (including the musical order that is called harmony).[55]

Nevertheless, a stage of deprivation of order and unformed matter is only hypothetical in the context of a mythical narration of the origin of the world. The Neoplatonists followed the tradition of Speussipus and Xenocrates and other early commentators of the *Timaeus*, who made clear that the account of the creation of the world is to be understood as a process that happens in time, but as a way of expressing the ontological dependence of the derived levels on the intelligible causes.[56] Consequently a lack of harmony or music (silence in this sense) in the material world is only hypothetical and responds to the question of what the world would be like without the presence of music, which is brought here by Soul and Intellect (unless one is referring, according to a different symbolism, to silence in Nature as peace and as a mode of manifestation of the peaceful and transcendent contemplation of the One).[57] Aristotle, on the other hand, conceived a silent world in contrast to Pythagoreanism, because he did not accept the theory of the

[55] This can be compared to the allegory of the cave in Plato's *Republic*. In visual terms, the cave is a shadowy place because of the lack of light. When the prisoner escapes to the surface, he experiences a loss of sight, but this time not because of deficiency but because of superabundance of light. The same logic can be applied to the perception of the Harmony of the Spheres or the intelligible music; they cannot be heard because the faculty of hearing is not accustomed to the profusion of sound in its purity. Cf. Macrobius, commentary on the *Dream of Scipio*, II.4.14 (cf. Cicero, *Scipio's Dream* V.3); Aristotle, *De caelo* II.IX.290 B; Censorinus XIII.I (Stahl's translation, note *ad loc*.). Cf. O'Meara (2007).

[56] Cf. Tarrant's translation of Proclus' *In Timaeum* (2007), Introduction to Book I, p. 26 and the authors quoted on note 4 there. Other ancient commentators did not agree with this non-temporal interepreation of the "creation" in the *Timaeus*: see Plutarch, *De an. procr.* 1013E ff., and Cherniss' note *ad loc*.

[57] The notion of the silence of matter corresponds more to a symbolic or metaphysical point of view; on the other hand according to the cosmological point of view, it can be said that the planet earth is silent (as in a well known novel by C.S.Lewis: *Out of the silent planet*). In different accounts of the Harmony of the Spheres, the earth is represented with the lowest note or without sound as in Cicero, *Scipio's Dream* V.2.

Harmony of the Spheres. In this sense, the Aristotelian world is closer to the modern scientific image of the world, which is devoid of spiritual sound and light. However, this tendency to devoid the world of music, in favour of a cold and rationalistic view of the world as mechanism, especially after Cartesian science, was counterbalanced by a revival of Platonic music in Romanticism and today —after another wave of rationalist abstract modernist music— in the music of Tavener that aspires to recover those lost qualities. While it would be worthwhile to study the influence of Neoplatonic theories of music on classical music and to illustrate the metaphysical conception of music depicted in this thesis by using audible examples, it is not possible to do so, given the length limitations of this work.

We hope that following the proposed chapter structure our study will be able to show how this theory of music is based on a metaphysics of Unity. The symbolism of the musical scale, which we explain in this thesis is the central doctrine that brings together the multiple aspects, ramifications and connections of this widely influential philosophical conception of Pythagoreanism/Neoplatonism.

The musical scale of the *Timaeus* follows a line that unfolds between the extreme points of the Intelligible and matter, in the same way that procession follows a straight line. The procession later arrives at a limit and follows a conversion (metaphorically speaking in temporal and spatial terms), when the Demiurge bends the harmonic mix of the Soul in a circle of return. For the moment it is important to see that music is related to both Soul and the concept of line and circle, because the scale follows a line and the string (of a musical instrument, which is a line), when divided proportionally, produces all the musical intervals and notes. The circular character can be appreciated by considering the way in which the ancient Greek tuning cycle works: a system in which the musical notes arise from an attunement by pure fourths and fifths ("method of concordance").[58]

It is important to have in mind also that in Neoplatonism, the line is not only a mathematical (geometrical and musical) term, but also a metaphysical notion that expresses the continuity of the levels of the world thanks to the Soul, and it is related, as in Plato's *Republic*, with the Principles and the ascent from the sensible

[58] See Barker (1989), pp. 49-50. Below we shall explain in more detail in which sense the fourths and fifths have a circular character. From another point of view, the notion of "recurrence" or "periodicity" is linked by Ptolemy with the musical interval of the octave. Cf. Barker (1989), pp. 332-333.

world to the Intelligible in a vertical ladder (the harmony of the spheres). This is because the three analogies or symbols in the *Republic* (the Sun, the Line and the Cave) and the myth of Er, were closely related in the Neoplatonic interpretation (Cf. Proclus, *In Remp*. I.287.20 ff.).

We have tried to reflect the metaphysical cycle in the thesis as a whole, thanks to the musical symbolism that holds all levels together.

Chapter I. The harmonic structure and scale of the World-Soul

The philosophical approach to the musical scale of the Timaeus

We may direct our attention first to the musical scale of Plato's *Timaeus*. Our explanation will follow a circular pattern, turning around the scale to discover different layers of meaning. For that reason we will deal with each question from different points of view. In our case in particular, it is important to combine different aspects and interpretations because we are dealing with two levels of exegesis, one being Plato's text and the second Proclus' interpretation of that text. Both Plato and Proclus have the intention of transcending the superficial, and after all, what Proclus says he is doing is just to show the deep meaning of Plato's text. He says that he is only following Plato's intention and explaining the *lexis* (the text) in order to make that intention more explicit,[59] applying what the Neoplatonists call "*dianoia*" (reason and understanding) to unfold the inner *noetic* (Intelligible) meaning of the text. In this way of reading, *dianoia* is assisted by the illumination or inspiration of *Nous* (Intellect). To study how a Neoplatonist finds the *noetic* meaning of a text, and in our case, of a musical scale, is the scope of our study.

We are going to present an interpretation of the scale of the *Timaeus*, which is depicted with numbers in Plato's text. However, although our study includes Proclus' working out of the scale, we are more interested in the explanation, on the occasion of the scale, of the philosophical problems that concern Proclus than in the technical description of how numbers represent musical notes. In doing so we want to show that the main interest in depicting this musical scale is to illustrate music's ability to be a symbolic evocation of metaphysical reality rather than giving a technical account of the theory of music.

According to Neoplatonism, it is necessary to apply a different kind of vision or audition to perceive the deeper meaning (*hyponoia*) of a text or of reality;[60] it is

[59] Proclus' commentary aims to explain "*ta pragmata*" (the subject matter): the metaphysical reality revealed by allegorical exegesis (*In Parm*. 664.2 or 665.12), as opposed to the "*lexis*", the details of the text. Cf. introduction to Book 1, in Morrow-Dillon's (1987) translation of the *In Parm*., p. 12. Cf. Tarrant's introduction to Vol. 1 of his translation of the *In Timaeum*, p.13 ff. about the formal features of Proclus' commentary.

[60] Cf. Plato, *Rep*. 378d ; Plutarch, *Mor*. 19e. On the notions of *hyponoia* (translated as "under-sense" or "hidden-meaning") and *allêgoria* (allegory) in Neoplatonism, see Sheppard (1980) ch. 4, pp. 145 ff.

not enough to engage with material reality and see it as something empty. The commentator who follows the Neoplatonic manner of study should obtain *noesis* (intellectual intuition) from no matter what he sees or hears, because everything occasions *anamnêsis* (remembrance) of the principles. Neoplatonists like Iamblichus and Proclus see and hear with some illumination or reverberation already shining or sounding in their way of perceiving, which is proper to an inspired interpretation (*noetic*), which can be called "inspired" in the sense that it attempts to understand with the same spirit (and sympathy) in which something has been written. That way of seeing things is different from the empty seeing of unsubtle reading. In our case, the scale should be seen as a symbol of Platonic metaphysics.

The relation between Music and soul and the problem of the essence

In the *Timaeus*, music and harmony are intimately tied to the generation of the Soul (*psychogony*). This is why we need to bring in the philosophical problems from the beginning; firstly because the notion of soul is central in Platonism and secondly, because in the context of the composition of the soul in the *Timaeus*, as Proclus explains, Plato "established the soul from the primary genera and from numbers and from harmonic ratios" (*In Tim*. II.136.2).[61] We need to explain at the same time three aspects:

a) the material, or the content: in this context, the elements or components (portions of the mix of the soul, numbers, musical notes, etc.) that will be unified by harmonic ratios that correspond to musical intervals. This leads us to the second aspect,

b) the form, i.e. the mathematical form of expression and logical order (*logos* = proportion), that organizes this material in a coherent musical scale (in a kind of musical space or container); this will be treated together with the relation between music and the other mathematical sciences[62]; and thirdly and most important,

[61] The "primary genera" are Being (*ousia*), Sameness and Difference, and the Soul, having and intermediate character, is a mixture of the divisible and indivisible kinds of Being, Sameness and Difference. For this reason harmony is an important principle, it helps to create a proportional mixture of those ingredients.Cf. Proclus, *In Tim*. II.126.15 ff. and see Baltzly's notes 68-69 *ad loc*.Cf. also *In Tim*. II.22.16, where he mentions that Plato has made use of numbers, volumes and musical pitches in his account, following the three kinds of proportion: arithmetic, geometric and harmonic.

[62] The mathematical sciences understood as analogical languages that express higher truths or principles.

c) the essence (the essence of the soul): the intelligible reality (*ta pragmata*) aimed at in Proclus' commentaries as the ultimate goal of the explanation and exegesis of the text.

Our method tries to follow the same logic, and combine the three levels of content-form-essence. We cannot deal here with the Aristotelian problem of the distinction or identity between form and essence, which is outside the scope of our study.[63] The notion of content or matter is intuitively accessible; however it is more complex to define form and essence. For example, a disc made of bronze has bronze as its matter and the circle as its form (or shape, figure, cf. Arist., *Met*. 1036a 32). But what is the essence of the disc of bronze? For answering that question (as in the typical Socratic question: what is it… ?), we need to think about the essence. The essential meaning of a disc of bronze is related to its function in symbolism and ritual (in the sense of final cause)[64], especially in Neoplatonism. Therefore in this case, the disc can be an image of the Sun and the Sun in turn is a symbol of the One; and that symbolic essence is shared for example by the mirror and the cymbal (both being discs of bronze used in the mysteries of Dionysos). It is in this sense that we are talking about the "essence" and meaning of the musical scale, which transcends its form and at the same time is expressed analogically by its form.

Proclus distinguishes in his *Commentary on the Timaeus*, the essence, the form and the substrate ("matter" in an analogical sense) of the soul:

> Further, through the words [he made it] 'out of such things and such manner', Plato wishes to bring to light the kinds that constitute the soul, as well as the manner of their composition and the ratios according to which the mixture has been divided. For [God] established the corporeal from certain elements and in a certain manner, contriving a certain proportion among them and a natural bond. But if God produced the soul 'out of such things' and 'in such manner', then God established a substrate, as it were, and a form of soul. So it is absurd to say that the essence of the soul is ungenerated on the grounds that it was established from these sorts of elements, but say that its form is generated. For he says that God produced both the matter (so to speak) of the soul and the ratio (*logos*) according to which it has been formed when it was conjoined by means. If the so-called elements of it – the Being, Sameness and Difference from which the whole is composed – are generated, so too is the entire substantial character (*to ousiôdês*) of the soul. (*In Timaeum* II. 119. 9 ff.)

[63] Essence : *to ti ên einai.* Cf. Guthrie (1981), pp. 215 ff. for a summary of this important question.
[64] Form and final cause can coincide, and sometimes the essence is not just the formal cause, it can be the final cause (e.g. see Aristotle, *Phys*. II.6, 198a24-27, cf. *Met*. H.4, 1044 a 32-b1). On the problem of how *idea* or *eidos* could mean both form and essence see Merlan (1968), p. 43: "the form represents the element of being (stability) as opposed to the element of becoming".

In this text we can see that the Soul has in a sense a "matter"[65] and a form related to the ratios and the proportional means, which are the source of the musical scale and harmony. On the other hand, there is also an inner level of *harmony*, which is not only form, but is an aspect of the essence of the soul. There are two aspects in the life of the soul for Proclus (cf. *In Timaeum* II. 124.20 ff.): because of the soul's discursiveness, the soul has a life which is dependent on higher principles and has a receptivity of them according to its nature; in this sense of causal dependence the soul is generated. In this respect, one aspect of the soul's life passes from one thought to another, projecting *logoi* at different times. But from another point of view — on account of being self-moving — the soul is capable of possessing the whole of an essential life (*ousiôdês*) at once, without succession and interval. For that reason Proclus says that the soul is "generated and ungenerated at the same time" (*In Timaeum* II. 124.25) and consequently time and eternity pertain to the soul simultaneously. There are two aspects of harmony that correspond to this distinction, the harmony proper to the discursiveness of the soul (and its potencies and activities) and the harmony proper to the essence of the soul.

Proclus explains in *In Timaeum* II. 125 10 ff, how the structure of this section of the *Commentary* (*Psychogony*), is based upon different aspects within the nature of the soul; and that his exposition will follow different steps that correspond to those aspects. In the soul as in every being, there are three aspects: essence-potency-activity. The higher kind of life mentioned above (i.e. essential life) corresponds to the essence of the soul, which in turn has a triple nature: it contains substance (*hyparxis*), harmony (*harmonia*) and form (*eidos* understood now as *schêma*).[66] The substance of the soul presupposes its own mode of being, which is intermediary, made of intermediate ingredients, between the indivisible and the divisible (intermediate Being, intermediate Sameness and intermediate Difference).[67]

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[65] The soul is immaterial but it is composed of some "ingredients" in the mythical narration of the *Timaeus*.

[66] Here form or figure are understood as the principle of outward form, and in reality *ousiôdês* is, according to essence, a higher kind of form, as we shall see in connection with the category of space and the geometrical nature of the soul. This is related also to the Aristotelian definition of soul as form (*eidos*), but according to the perspective of Speusippus and Xenocrates, who prefer to understand that the soul is the form of all bodies in a mathematical sense and not only, as in Aristotle, a "form of living bodies alone", as Merlan (1968) pointed out (pp. 42-43).

[67] Cf. Plato *Timaeus* 35a ff., Cornford (1937), pp. 59 ff. and Proclus, *In Timaeum* II. 139.32 ff. and 155.1 ff.

The indivisible corresponds to intelligible Being and the divisible to everything that proceeds to corporeal reality:

> Therefore, we say that 'indivisible Being' means all intelligible Being and intellectual Being, both universal (*holikos*) and particular (*merikos*), as well as immaterial and separate, and whether prior to eternity or in eternity. But 'divisible' includes all Being which proceeds into the realm of bodies, whether this means the living things within the cosmos, or natures which make their way through these into extended regions, or physical irradiations (*physikoi logoi*) that are divided in the realm of qualityless corporeality. For all these things are divided in the realm of bodies. (*In Timaeum* II. 139. 14-20)

Between these two poles we find the nature of the soul:

> We must therefore divide all things by three, and having thus divided, we must arrange the psychic Being in the middle between the indivisible and the divisible, as an image of what is superior, but a paradigm for that which is inferior. [We should regard it] as simultaneously remaining and proceeding; as something that transcends the corporeal composite and as something of the same rank, for in all these aspects its appropriate intermediate [nature] is in evidence. And thus in a general way one must
> say that all Being between the One and the soul may be defined as indivisible, but all between the soul and bodies as divisible. (*In Timaeum* II. 140. 1-10)

The soul as intermediary is a bond and at the same time the soul is bound by three means which unify and connect its essence (cf. *In Tim*. II.198.29). These means, —called "bonds" by Plato (*Tim*.31c) and Proclus (II.199.1)—, unify the soul as a substantial totality (*to ousiodês pan*) and its proportional structure (that contains the three means in itself) makes the Soul capable to function as a mean that provides unification and order to the cosmos.[68] In this sense, musical harmony, which is based on proportional ratios, is the inner and intrinsic bond that unifies the mix of the soul. As we shall see, the musical scale is appropriate for illustrating this metaphysical concept of harmony and bond because it is composed by *peras* (limit) and *apeiron* (unlimitedness), made of odd and even numbers, which correspond in the plane of mathematical reality — understood as an analogical language — to the metaphysical notions of indivisible and divisible.

Proclus examines the relation between Limit and Unlimitedness in connection with the pair indivisible-divisible reality in *In Timaeum* II. 138.5 ff, where he considers the Intellectual realm akin to Limit, Sameness and Rest, while the corporeal is akin to Unlimitedness, Difference and Motion. In the indivisible there is a predominance of Limit, to such an extent that because it possesses Sameness and Rest one is puzzled, Proclus says, whether there is Difference and intellectual motion in it (*In Timaeum* II. 138.10). On the corporeal level there is a predominance of Unlimitedness and if it were not for its participation in the

[68] We shall see that the scale of the soul contains the geometric, arithmetic and harmonic means.

Intelligible it would not have permanence and unity. The soul is intermediary between unity and multiplicity, being both stationary and moved, composed of intermediary elements; and although the soul is divisible, its divisibility is contained by harmony, and this is shown by the fact that its portions are not divisible in an unlimited way:

> Thus, just as bodies can be divided in an infinite number of parts since they are divisible, when souls are divided it is into a limited plurality. So the case is like the division of number into units; and from this fact some have thought it worthwhile to call the soul a number. [Soul is like a number] in as much as it is divisible, yes, but divisible into things that are indivisible [like units] and not into things which can always be further divided [like the parts of bodies]. Because of this, the indivisible [character] of the soul is twofold: first, in virtue of its being a whole of sorts and, second, in virtue of the last of its parts. Now, each number too is –in respect of its appropriate form – one and indivisible, but in respect of its "matter" (as it were) it is divisible. And this is not even the case throughout, but in the case of the final unit found in this matter – the one in which the division terminates – it is indivisible.(*In Timaeum* II. 138.17-26)

As this text shows, the nature of the soul is intimately related to the nature of number, according to Xenocrates' famous definition mentioned here by Proclus. In the *In Timaeum* II. 165.8 ff, Proclus quotes Xenocrates' definition again and explains that the soul's *ousia* is one and single composed from multiple essences (substances), being an essential number "that remains through the whole of itself, simultaneously single and divided into a plurality of substantial parts" (*In Timaeum* II. 165. 10). In the same way we can say that, from the point of view of music, the soul is an essential harmony composed of substantial intervals (i.e. the intervals are inherent in its nature as a result of ideal harmonic divisions), which produce a limited plurality that cannot be divided into infinity. Here resides, as we shall see later, the importance of the harmonic division of the scale in octaves, fifths, fourths and tones (and *leimmata*). In Pythagorean harmonics all intervals (with the exception of the *leimma*) are expressed in multiple and epimoric (superparticular) ratios. The octave (2/1), the octave + fifth (3/1) and the double octave (4/1) are multiple ratios of the form mn/n. The fourth (4/3), the fifth (3/2) and the tone (9/8) are epimoric ratios of the form (n+1)/n; the fourth is "epitritic", the fifth "hemiolic" and the tone "epogdoic".[69]

Mathematics and the essence of the soul

As can be seen from the above considerations, with this conception of metaphysical essence expressed in a mathematical way, we are again in the

[69] Cf. Barker (1989), p. 35, note 27 and Eucl. *Sect. Can*. 149.11 ff. and propositions 10-11. On the interval of *leimma* see Barker (1989), p. 60, note 18. On the names of the ratios see Philolaus, fr. 6.

context of the relation between different notions: essence, form, limit and division, which were important for the early commentators of the *Timaeus*, from Xenocrates to Posidonius and Plutarch.[70] As Merlan states, Xenocrates, according to Plutarch, interpreted the Psychogony as arithmology (concerning the generation of number).[71] In doing so, he identified the nature of the soul with one branch of the mathematical sciences: i.e. arithmetic. The subsequent commentators, and especially Posidonius, as Merlan points out, identified the essence of the soul, not only with one branch of the sciences, but with at least three branches: arithmetic, music and geometry.[72]

Arithmetic corresponds to the discontinuous (discrete numbers or quantity), geometry corresponds to the continuous (continuous proportion or magnitude: figures); and here comes the central and intermediary aspect of harmony: it is the power that can join these two other aspects. Music is a central discipline for understanding the essence of the soul, because harmony plays this important role of unifying the arithmetical and geometrical aspects of the soul.

Iamblichus and Proclus followed Posidonius, as can be seen in Merlan's explanation of a text by Proclus (*In Timaeum* II. 238.16- 239. 6), where he emphasises that for Proclus the soul possesses all the mathematical sciences "substantially". This means that the sciences are intrinsically present to the soul not only in the mode of knowledge but also in the mode of being (*ousiôdês*), as belonging to its essence.[73] Proclus' passage continues:

> Therefore the soul has antecedently comprehended all these [mathematical] sciences in a substantial manner (*ousiôdês*) – the geometric science in virtue of its wholeness, in virtue of its shape, and in virtue of its lines; but it comprehends the arithmetic science in virtue of the plurality and the substantial units within it, as has been shown previously. The harmonic science is included in virtue of the ratios of numbers, while the science of spheres is there in virtue of its double revolution. And this is truly the binding together of the mathematical sciences, including all things that are substantial, self-moving, intellectual, and unified in a manner that is pure and devoid of shape. It includes the shapes in a manner that is without shape, while things that are discrete are there in a manner that is unified. The things that involve extension are there in an unextended manner. After all, these things pertain to the essence of the soul and it is necessary to consider that all things are in it in this manner (*In Timaeum* II. 238. 5 - 239. 15).

According to Proclus, the soul's essence is triple and this is mirrored especially in the first three mathematical sciences:

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[70] Cf. Merlan (1968) chapters I and II, especially pp. 38 ff.
[71] *Ibid*., p. 34.
[72] *Ibid*., p. 36.
[73] *Ibid*., pp. 23-24.

1) Arithmetic and discontinuity show the notion of transcendence; numbers as ideal principles and especially the Monad, are transcendent realities.

2) Geometry and continuity show on the other hand, the immanence of the principles in forms and the vertical line or chain of participation that joins all the levels. Verticality in one sense recalls the transcendence of the Monad on top, but at the same time, represents the link that joins the effect with the cause, thus immanence. The circular, which is another of the essential shapes of the soul, can represent again the return to the principle — the conversion that makes possible the immanence — or from another point of view, this image can represent transcendence if the levels of reality are understood as concentric circles, because each circle is discrete from the other. The straight radius in this case joins the peripheral with the centre, which is an image of the Monad (analogous to the image of the Monad on top according to the vertical representation).

3) Music (harmony), as we have said, is intermediary between the discontinuity of the arithmetical and the continuity of the geometrical, and the musical scale has both linear form (ascending and descending) and circular form, the musical notes recur thanks to the generation of the scale through the circle of the fifths.

The soul's essence is composed of substance, harmony and form, as stated by Proclus (*In Timaeum* II. 125. 24 ff.); consistent with this we can associate substance with arithmetic, harmony with music (or the science of harmonics) and form with geometry. Astronomy in its common sense is a further instance in the procession, more outward because it concerns moving solids; in this sense it is rather related to the soul's potencies and activities than to its essence; nevertheless there is an ideal astronomy which is intrinsic to the soul too, and it is a projection of the essential geometry. There is also a level of music which is parallel and complementary to the level of astronomy directed outwards to the sensible world;[74] this is the level of harmony as a reflection of the essential harmony of the soul, mentioned above in relation to the two levels of the life of the soul (intuitive and discursive), mirrored in the two circles of the soul: the Circle of the Same and the Circle of the Other (keeping in mind that one of the circles is inside the other).[75]

[74] Depending on which level of music one is talking of, one can find accordingly different arrangements of the mathematical sciences, sometimes music comes after geometry and at other times before it.

[75] We are going to represent the musical scale in a circular form, cf. pp.158 ff. below.

As can be seen all the sciences are deeply interrelated, not only as a cognitive activity but also as an essential component of the soul, and they mirror the triple essence of the soul, which contains also substance, harmony and form in an interrelated way.[76]

> All these things are also in one another. In the first instance, the essence of the soul has the harmonised plurality together with itself. For it is not without plurality, nor does it have only plurality that is, however, unharmonised. The substantial harmony is also substantial (*ousiôdês*), since it is connective and formative (*eidopoios*) of [the psychic] essence.[77] […] the form is inclusive of the harmonic ratios and also includes the essence of the soul, for it is especially in respect of this that the defining characteristic of the soul is delineated and there is one definition according to which it is just what it is. Therefore all these things are in one another – the substance (*hyparxis*), the harmony and the form – and the essence (*ousia*) of soul is both single and triune in nature, since it has been established from the three kinds: Being (*ousia*), Sameness and Difference. (*In Timaeum* II. 126. 9-27)

Proclus comments (II.126.27) that these three components correspond analogically in the following way to the substantial attributes of the soul:

Being ~ essence
Sameness ~ harmony
Difference ~ form

We could add the correspondence with arithmetic, music and geometry respectively, according to what we said above.

There is a relationship between the Being/Sameness/Difference triad and the triad of Essence/Potency/Activity, because according to Proclus (II.126.30) the Soul is triple from the start, having essence (*ousia*), potency and activity. This essence (the first term of the triad) is itself triple, composed of Being, Harmony and Form. At the same time, Proclus says (II.157.26) that the first term of this essential triad (Being), which in this passage is identified as existence (*hyparxis*) is in turn composed of that which is strictly called Being (*ousia*), Sameness and Difference.[78]

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[76] Since the triad is cause of the tetrad, in a way this essential triad is cause of the tetrad of the four sciences.

[77] At this point Proclus digresses to explain that since the harmony of the soul is substantial, Plato is consistent with himself in establishing here that the soul is a harmony while on the contrary he criticizes those who say this in the *Phaedo* (92a – 95a). Here in the *Timaeus* the soul is harmony both of itself and of other things in an intrinsic way, which is the real Pythagorean view; whereas it is not correct to say that the soul's harmony is merely an attunement of another thing (the body) and make the transcendent dependent on the derived and secondary.

[78] Proclus says that there is a plurality of instances of Being, Sameness and Difference manifested in the Soul, according to its proportional divisions and the corresponding harmonization of the portions, see II.143.1-3 and II.138.15.

Proclus arranges his commentary in accordance with the essence of the Soul (which is triple: Being/Harmony/Form) and to this he adds potency and activity, in order to have a pentad of the Soul, because:

> The pentad is fitting for the soul as an intermediate, connecting the bond of the monad and the ennead, just as the soul itself connects the intelligible Essence and the sensible realm. (*In Timaeum* II. 127. 3-5)

The pentad is the arithmetic mean between the Monad and the Ennead, and also if we think of this symbolism in its geometrical form, the Monad corresponds to the centre and the Ennead to the circle, and together they make the Pythagorean Decad.[79] The soul is intermediary between the central and the peripheral life; if we represent the levels of reality as concentric ones, then the circle of the World is concentric to the circle of the Soul, and at the same time the Soul is concentric to the Intellect, which is closer to the centre, because the Intellect is also a circle that turns around the One.[80] Both the pentagon drawn inside a circle in geometry and the interval of fifth in music can represent this intermediary and connecting nature of the soul, as we shall see in the following pages.

In a sense, for Proclus, the Intellect is a Sun (reflecting the One) and the Soul is its rays and its light (reflected on the illuminated Ether).[81]

> […] the intellect which is participated by soul is called by Plato 'indivisible Being', while the corporeal life that proceeds from soul to the realm of bodies and which has the role (*logos*) of the light rays (*augê*) in relation to it is called 'divisible Being'. For the intellect is analogous to the Sun, while the soul is analogous to the light from the Sun, and the divisible life is, in turn, analogous to the ray that comes from the light. (*In Timaeum* II.143.10-16)

From this point of view the soul is a radius projected from the centre towards the more exterior circle of sensible reality, where it proceeds and providentially connects and brings back everything that is illuminated by it towards the principles. Each individual life is like a ray connected to the centre as its origin; however, this origin is forgotten in the sensible world and needs *anamnêsis* to be reactivated through the help of mathematics and theurgy.

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[79] See Baltzly (2009) note 70 to his translation of this passage. It is strange that Baltzly mentions the Pythagorean Decad, but then he translates *monas* as unit and *enneas* as number nine, when there is a big difference in Pythagoreanism between these two levels of numerical reality. We modified his translation to show this subtle difference.

[80] See Proclus, *In Timaeum* II.243.4-17 and I.209.25 ff.

[81] See Plotinus, *Enn*. V. 1.2.20 ff on the soul compared to the golden light of the Sun that permeates from all sides and holds together from inside a cloud.

In the *anamnetic* and analogic quality of mathematics lies the value and significance of these sciences. It is not the case that the soul is just extrinsically compared to a sunray, a geometrical line or a musical scale; there is a real essential bond between the nature of the soul and these symbols, which once they are assumed in the reflection, act as remembrance reactivating the connection with the essential. For this reason the soul's linear and circular form belong to a higher geometry than the usual. The "line" and the "circle" of the soul are essential and self-moving as Proclus states (*In Timaeum* II.244.22 ff.). In this sense the form of the soul resembles a line or a circle, but not in the sense of artificial comparison (the Aristotelians could not understand this, cf. *In Timaeum* II.245.25 ff.). The soul contains the *logos* of the line and the circle, in this sense the soul *is* (like) a line or a circle as essential realities.[82] They are real and natural symbols (adequate to the analogy between levels of reality), not just extrinsic comparisons. The soul projects the *logoi* of the subsequent realities, lines, circles, etc. towards the realm of divisible things. Accordingly there are different levels of geometry:

> [Geometry] is coextensive with all existing things, applies its reasonings to them all, and includes all their kinds in itself. […] At the upper and most intellectual height it looks around upon the region of genuine being, teaching us through images the special properties of the divine orders […] Here it shows us what figures are appropriate to the gods, which ones belong to primary beings and which ones to the substance of souls. In the middle regions of knowledge it unfolds and develops the ideas that are in the understanding […] the forms of figures shaped from them in imagination it comprehends within fixed boundaries and refers back to the essential being of the ideas. At the third level of mental exploration it examines nature, that is, the species of elementary perceptible bodies […] and explains how their causes are contained in advance in its own ideas. It contains likenesses of all intelligible kinds and paradigms of sensible ones[83]; but the forms of understanding constitute its essence, and through this middle region it ranges upwards and downwards to everything that is or comes to be. (*In Euclidem* 62.1-26, transl. Morrow)

In the following pages we shall attempt to show how the same applies to music and harmony. Music is coextensive with and is present to all the levels of reality and the musical scale expresses how harmony ranges upwards and downwards to every step of the ladder of reality. In our analysis we need to expand our own modern conception of geometry, music and science in general (characterized by materialism and technological application) in order to understand the wider and higher significance that these disciplines had for Platonists and Pythagoreans, philosophers

> whose byword and proverb was 'a figure and a stepping-stone, not a figure and three obols.' By this they meant that we must cultivate that science of geometry which with each

[82] The straight line corresponds to the discursiveness of the "life-giving" potencies of the soul; the circle corresponds to their self-motivity.
[83] Cf. Proclus, *El.Theol.* Prop. 195 quoted on p.13 above.

> theorem lays the basis for a step upward and draws the soul to the higher world, instead of letting it descend among sensibles to satisfy the common needs of mortals and, in aiming at these, neglect to turn away hence. (Proclus, *In Euclidem*, Prologue II, 84.17, transl. Morrow)

The Neoplatonic method of analysis is not interested in staying at the level of the plain explanation of the musical intervals and numbers; the method continues further in order to find a "language" that unifies these contents as elements or letters: the mathematical mode of expression, which is the particular "form" of Pythagorean cosmology and from there to point to a transcendent Unity of the topic studied, which can only be reached at the metaphysical level — the inner or essential meaning of the exegetical language. That Unity, final cause of the analysis of the musical scale, is according to the Pythagorean School reached when music is directed to intelligible Harmony, which in turn aims towards the One, source of all harmony. We use the word "analysis" intentionally, and we employ it in its Platonic/Neoplatonic sense, which means the way of return and ascent towards the principles.

The *Timaeus* of Plato is an analysis of the World that follows an ascending path, from the elements that compose the World, outwardly and closer to us, towards the causes and principles, which belong to deeper (inner) and higher levels. This kind of analysis is one of the methods of Dialectic, the other is division (*diairesis*) as Alcinous clearly states in his *Didaskalikos*.[84] Dialectic is for Alcinous:

> the examination of the essence of every thing whatsoever (*Didask*. 5.1, transl. Dillon)

and studies the nature of each thing according to two main methods: division as the path of descent (*katôthen*) from the Principle and analysis as the path of ascent (*anôthen*) from the sensible world to the Principle.[85] The Neoplatonists will follow Alcinous in considering analysis as return.[86] For them, in the context of

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[84] Cf. Dillon's translation (1993), pp.8-10 and his commentary on pp. 72 ff.

[85] Dillon, *ibid*., p. 75, points out the Aristotelian origin of this notion of analysis , quoting *EN* 3 1112b 20-4 : "That which is the final product in the analysis is primary in point of generation". If we understand "generation" in the Pythagorean sense of mathematical derivation applied by Plato in the *Timaeus*, then, as we shall see, the mathematical progressions can be reduced to their principle of generation following the path of analysis in an ascendant way, towards the Unity. Although Alcinous uses Aristotelian terminology, his examples come from Plato, *anodos* towards the *noêtos topos*: path of ascent, from *Republic* VII. 517b 5 and *Symposium* 210a ff; cf. Dillon, *ibid*. p.75.

[86] Cf. Iamblichus, *Protr.*, p.22-23 Pistelli, Proclus, *In Crat*. 3. 7-8. See Siorvanes (1996), pp. 55 and 115. For the Platonic background of this conception of analysis see Cherniss (1951), pp. 414 ff., especially p. 419 where the author quotes more passages from Proclus' *In Eucl*.

Pythagorean exegesis, geometrical analysis leads to cosmological and metaphysical analysis, as Proclus says:

> we shall, with a natural spontaneity, be able to complete our *analysis* according to Pythagorean principles (*archas*). (*In Timaeum* I.183.20)

The Neoplatonic analysis corresponds to a symbolic interpretation of the text, which is adequate to the style and "form" (*eidos*) of the dialogue, which is Pythagorean, as Proclus states, and it is characterized by:

> Loftiness of mind, intuition (*to noeron*), inspiration, a tendency to link everything with the intelligibles, to depict the Whole in terms of numbers, to give an indication of things in symbolic and mystical fashion, to lead upwards, to remove one's focus on the particulars, to state with affirmation. (*In Timaeum* I.7.25-30)

When the Demiurge divides the mix of the Soul, then he is following the path of procession; when he harmonizes the divisions, he is unifying the intervals following the path of return. The musical analysis of the scale reduces all the intervals to Unity, represented in the first portion or note. If we think about a harp as an illustration, and we consider the first portion from which the Demiurge starts as the highest note, given by the shortest string, then all the other strings can be seen as covering the first.[87] For if we look at the harp from the longest extreme (where the column is), towards the sound box, the longest and lowest strings would cover the shortest and highest strings. If we start taking away string by string, from the lowest ones, following the path of analysis, we will be following the path of ascent and return to the One.

According to the proposed methodology we will present examples or illustrations, such as the just mentioned symbol of the harp, that help us to understand the musical scale, which is not an abstract accumulation of sounds but a symbol that leads to the spiritual whole and the Intelligible. The procession, now if we follow the descendant path, will start in a highest note or term, represented with the first term (1). In the example of the harp, as we have said, this corresponds to the highest note and shortest string, which is closer to the heart of the player, thus showing that procession descends outwards. The higher levels or states of being are represented then with high-pitched sounds.

[87] The illustration of the harp is mine, however see Aelianus *apud* Porphyry. *Comm*. 34.29 in Barker (1989), p. 232 and [Arist.] *Probl*. XIX.23 in Barker (1989), p. 93. On ancient harps and their symbolism see below p.73 and note 176 *ad loc*.; note 212 in p. 93 and note 216 in p. 94.

The composition of the World-Soul and the double progression

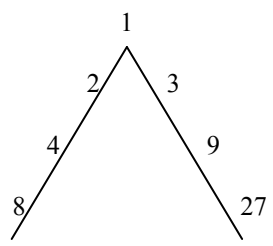
In *Timaeus* 35b - c Plato describes how the Demiurge composes the mix of the World-Soul and divides it according to proportional numbers:

> Then, taking the three [elements of Existence, Sameness and Difference], he blended them all into a unity, forcing the nature of Difference, hard as it was to mingle, into union with Sameness, and mixing them together with Existence. And having made a unity of the three, again he divided this whole into as many parts as was fitting, each part being a blend of Sameness, Difference and Existence. And he began the division in this way. First he took one portion (1) from the whole, and next a portion (2) double of this; the third (3) half as much again as the second, and three times the first; the fourth (4) double of the second; the fifth (9) three times the third; the sixth (8) eight times the first; and the seventh (27) twenty-seven times the first. (transl. Cornford)

In this division a mathematical progression of numbers comes into view, presented here in brackets. The progression is in fact a twofold one —in continuous geometric proportion—, composed of a "double" progression of even numbers (1-2-4-8) and a "triple" of odd numbers (1-3-9-27). Plato changes the natural order of 8 and 9 because he interleaves the even with the odd.[88]

Both geometrical progressions start with unity as a common principle, because the one is not a number[89] but the principle of number, the source of both series containing in itself the even and the odd, that correspond to the principles of Unlimitedness (*apeiron*) and Limit (*peras*) respectively.[90]

The seven numbers of the *Timaeus* were represented by the first commentators of the *Timaeus* in an arrangement with the shape of the letter *lambda* "Λ". This diagram shows how the opposition (*peras-apeiron*) is harmonized in the transcendent Unity on top, and it was attributed by Plutarch (*De An. Procr.* 1027 d) to Crantor (IV-III c. BC):[91]



[88] If the representation of the numbers in the "*lambda*" scheme can be ascribed to Plato he could have read the numbers taking one from the column of the even and one from the column of the odd and so on. Cf. Cornford (1937), note 1, p. 66.

[89] Archytas, fr. DK 47 A19. See Huffman (2005), pp. 451 ff, especially p. 460 where he mentions that "for Euclid as well as Archytas, one is not a number." Cf. Euclid, *El.* VII, Defs. 1-2.

[90] Cf. Cornford (1937), p.66; Guthrie (1962), Vol. I., pp. 243-244. Cf. Anon. *Theol. Arith.* 1, 9 ff. and 3, 2 ff. and Aristotle *Metaph.* 986 a 17.

[91] Cf. Cornford (1937), p.67 and Huffman (1993), p.377.

The position of the one at the top and the numbers following in a twofold way downwards symbolizes with precision the progression or derivation of numbers from the Unity, which is also the derivation of the different dimensions of space that is the object of Geometry (this is why this proportion is called "geometrical").[92] The numbers of *Timaeus* 35b - c represent a series point-line-figure-solid and *proceed* then from the Unity in a double series of two and three (even and odd), and correspond to each dimension (according to the limits marked by the points that represent the unities composing each number): the unity (or the monad) is the point; the first potency of two ($2^1 = 2$) is the line; the square of two ($2^2 = 4$) is the plane figure (the square); the third power (cube) of two ($2^3 = 8$) is the geometrical solid (the cube); the same can be said about the triple progression: 1; 3 ($3^1 = 3$); 9 ($3^2 = 9$); 27 ($3^3 = 27$).[93]

For this reason the progression from point (indivisible) to solid (divisible) also represents the fact that the harmony of the whole reality, the whole Heaven, is derived from numbers, as Aristotle says:

> they [the Pythagoreans] saw that the modifications and the ratios of the musical scales were expressible in numbers; since, then, all other things seemed in their whole nature to be modelled on numbers, and numbers seemed to be the first things in the whole of nature, they supposed the elements of numbers to be the elements of all things, and the whole heaven to be a musical scale (*harmonia*) and a number. And all the properties of numbers and scales which they could show to agree with the attributes and parts and the whole arrangement of the heavens, they collected and fitted into their scheme. (*Met.* 985 b 23, transl. W. D. Ross)

The study of music is presented in this testimony as the foundation for the analogy between mathematics and cosmology.[94] If the composition of the whole heaven (and the orbits of the planets) is like music —or makes music— and all music proceeds from ideal numbers, then the whole cosmos must have its origin in the elements of number. In the *Timaeus*, if the Soul is composed as a musical scale and shares the quality of invisibility with sound, then it can be said that the arrangement of the world is derived from an immaterial music. Both kinds of

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[92] Cornford (1937), p. 45 ff. provides a clear and detailed explanation of proportion.

[93] Cf. Burkert (1972), p.395 for the series point-line-square related to musical intervals in a testimony about Philolaus in Boethius (A 26 = Boeth. *Mus*. 3.5 p.276.15). On p.43 (cf. also p. 67) Burkert claims that the system of derivation and "the reduction of the physical world in the schema of body-surface-line-(point) belongs to the Platonists, not to the Pythagoreans". We are not going to discuss this here, and since we are studying the *Timaeus*, we can find this derivation in this dialogue as Platonic, but we need to bear in mind that for the Neoplatonists, Timaeus is himself a Pythagorean philosopher.

[94] This relation is the foundation of the system of sciences that follow a derivative order, in Pythagoreanism, especially in Nicomachus: arithmetic, music, geometry, astronomy. Music, as a science of relations, makes possible the relation between arithmetic and astronomy, showing the mathematical foundation of the order of the planets in the Harmony of the Spheres.

harmonies, *i.e.* cosmic harmony and that of the Soul proceed from a combination of "*peras*" and "*apeiron*" (manifested in the distinction between odd and even), which are the elements of number as we have seen.[95] The interval of fifth, the ratio of which corresponds to the numbers 3/2, is one of the basic concords used for the generation of the scale in Pythagoreanism.[96] This ratio is a mixture of odd and even, showing how harmony is a combination of opposites. Philolaus presented a similar doctrine of harmony as a third unifying principle of the opposition of the two other basic principles:

> Concerning nature and harmony the situation is this: the being of things, which is eternal, and nature in itself admit of divine and not human knowledge, except that it was impossible for any of the things that are and are known by us to have come to be, if the being of the things from which the world-order came together, both limit and unlimitedness, did not preexist. But since these principles preexisted and were neither alike nor even related, it would have been impossible for them to be ordered, if a harmony had not come upon them, in whatever way it came to be. Like things and related things did not in addition require any harmony, but as for things that are unlike and not even related nor of [?the same speed], it is necessary that such things be bonded together by harmony, if they are going to be held in an order. (F6DK, transl. Huffman, modified)[97]

The cosmogony of Philolaus would probably have been based on the idea of musical harmony, as can be seen in the continuation of this passage (Fr.6a), which describes the fundamental intervals of the scale, given that Fr.6 forms a single quotation of Philolaus' book, as scholars like Huffman have shown.[98] Although we do not know with certainty how Philolaus continued his cosmological account —due to the fragmentary character of his surviving writings—, we can say that for Proclus, Philolaus and other Pythagoreans were the source for the cosmology of the *Timaeus*. Therefore, the notion of the origin of the cosmos residing in a basic principle of harmony —in Philolaic terms— is fundamental for the Neoplatonic understanding of why Plato presents the World-Soul as a harmony, because the Soul is the nearest principle of the order of the physical world (cf. Proclus, *In Timaeum*, II. 207, 28-32).

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[95] The interpretation of the *Timaeus* according to the principles of *peras* and *apeiron* is related to the Pythagorean tradition combined with Plato's account of the pair of correlated principles in the *Philebus*, considered by the Neoplatonists as genuine Pythagorean doctrine. Cf. Proclus, *Platonic Theology*, I, ch. 5, 25, 24-26, 9, quoted and commented on by O'Meara (1989), p. 146.

[96] We are going to explain below (p.46 ff.) how Proclus understands the concord of fifth as a "generative" and "returning" interval (cf. II.222.29 quoted on p.112 below) and if it is possible or not to characterize it as the basic interval for the generation of the scale, as Barbour (1951, pp. 1 ff.) and other studies on the history of tuning say, but without much evidence in ancient texts.

[97] The brackets are Huffman's (1993), p. 123-124.

[98] Fr.6 and Fr.6a are quoted continuously in Stobaeus and F6a is quoted again in Nicomachus. On the connection between Philolaus' Fr.6 and Fr.6a see Huffman (1993), p.159 ff.

In addition, as we have seen, the harmony of the Soul depends itself on an intelligible Harmony which is proper to the divine Intellect, a level which is also a manifestation of the combination of the principles of *peras* and *apeiron*.[99] At the same time, since Music is a derived science in itself the connection between the generation of the cosmos (and its World-Soul) and the generation of the musical scale was associated with the generation of number from those principles (*peras-apeiron*) in arithmetic. In any case, both sciences are intimately linked because the discrete numbers generated from the Unity are at the same time joined by way of harmonic proportions.

According to Huffman it is possible that Philolaus already linked the limiting principle with odd numbers and the principle of unlimitedness with even numbers.[100] The Neoplatonists, after a long tradition of considering Platonic doctrines as developments of ancient Pythagorean ones, would confidently add to these correlations also the coordination between "male" —corresponding to the odd numbers and the triple progression with its musical intervals of octave + fifth (1-3-9-27)— and "female" —corresponding to the even numbers and the double progression with its progressive intervals of octave (1-2-4-8).[101]

Proclus' Neoplatonic interpretation develops Philolaus' theories and supposes the coordination of a limiting principle (principle of delimitation or determination), which is coordinated to the "male" aspect of the Pythagorean table of opposites;[102] while the principle of unlimitedness corresponds to a "female" aspect of potency (principle of projection), that *opens* a linear "space", represented in the *length* of the octave.[103] This space, which is opened by the

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[99] See note 52 above.

[100] Huffman (1993), p. 181-182.

[101] See Proclus, *In Tim*., II.221.8 ff. on the relation between the progressions of the *Timaeus* and the coordination of male-female and odd-even. Cf. *In Tim*., II.242.2 ff. on the connection between the principles of monad and dyad, and other opposites: even and odd, male and female, intellect and soul, etc. Male and female are clearly coordinated to limit and unlimitedness in II.262.22.

[102] On Aristotle's Pythagorean table of opposites in *Met*. 986a 22 see Burkert (1972), p. 51 ff., Kahn (2001), p. 65 and Huffman (2005), p. 590. For our study we do not need to discuss whether this table belongs to early Pythagoreanism or is an expression of Academic Pythagoreanizing Platonism.

[103] Philolaus (Fr 6a) uses the expression "*harmonias megethos*"; and this could show that in a way the octave (*dia pasôn*) is related to the notion of length (and also the fourth and fifth —called *syllaba* and *di' oxeian*— that compose it). However, we do not mean that Philolaus analyzed the scale or the octave as a length; it is well known that for the Pythagoreans a musical interval (*diastêma*) is analyzed as a ratio (*logos*), and it is not understood as a magnitude or distance between notes; it is rather a relation and a structure. We are presenting Philolaus' example, as an illustration of this connection between magnitude and structure, in order to identify a continuous musical space, which when divided and organized by "limit" and ratio becomes musical scale.

progression 1-2-4-8, will act —when orientated to the Intelligible— as the "recipient" (or receptacle, *hypodoche*) of intelligible harmony.[104]

In order to understand in what sense we are referring to the category of space it is useful to bear in mind the application of *peras* and *apeiron* to geometry. Both for Philolaus and Proclus geometry is the primary mathematical science,[105] from the point of view of what is first known to us. Philolaus explains the world in terms of Limit and Unlimited, as Huffman remarks, because these principles illustrate how the world results from "the imposition of shape and structure on indeterminate *continua*."[106] In the case of the musical scale, the *continuum* of sound is opened by a progression of octaves and divided in intervals (especially the fourth and the fifth), which give structure to sound and melody.[107] Although we may say that the octave is already a determination of the *continuum*, on the other hand, according to the symbolism of the even and odd numbers, the octaves are identified with division and procession. Nevertheless, the musical structure derives from the combination of limit and unlimitedness manifested in all the main ratios: 2/1; 4/3 and 3/2. The ratios of the fourth and the fifth, like all epimoric ratios, are composed by one odd and one even number, portraying again the relation between male and female. Burkert compares Pythagorean harmonics with ancient Chinese musical cosmology, where the same correlations were made between 3/2, 4/3, male-female and Yin-Yang.[108] In the Chinese musical system depicted by Granet (1934, p.181; cf. p.131) the basic interval is the fifth which expresses the following relationships:

Yang = Odd = Heaven = Circular = 3

Yin = Even = Earth = Square = 2

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[104] Cf. *Timaeus*, 48 E ff and 51 E-52 D, where Plato relates the notion of *chora* (space) and *topos* (place) with the receptacle. In musical terms this space is produced in a linear way by the progression of even numbers that represent the intervals of octaves.

[105] Cf. Huffman (1993), pp. 194-193 and O'Meara (1989), pp. 166 ff.

[106] Huffman (2005), p. 70.

[107] On the relation between the *continuum* of melody, infinity, musical motion, discrete and continuous quantities, etc. in Aristoxenus and other authors, see Levin (2009), pp. 88 ff. Cf. Barker (1989), pp. 132 ff. The notion of continuity (*synecheia*) is very important both for Aristoxenus and for Proclus; for the latter, this term has mathematical and metaphysical significances (e.g. *In Tim*. II.16.30).

[108] See Burkert (1972), p. 471, who quotes Granet (1934), pp. 230 ff. On the relation between Pythagoreanism and Chinese philosophy and music see also Needham (1956 and1962), Vol.2. Section 13.d.4 "Pythagorean numerology" and Vol. 4. Section 26.h. Sound (Acoustics).

The tuning system of the Chinese was fixed by means of a series of 12 tubes or bells, which consisted in six male sounds (odd) and six female sounds (even).[109] With this parallel we do not intend to claim a historical or connection of mutual influence between the two systems (Chinese and Pythagorean) and we are aware of the differences between the Pythagorean scale and the Chinese scale.[110] We propose the example, as Burkert does, in order to clarify the concepts. The parallel is not irrelevant because we find many similarities. For example, the theorem of Pythagoras and the basic triangle 3-4-5, perpendicular side 3, base 4, hypotenuse 5 was related by Plutarch (*De Iside et Osiride*, 374), with the Pythagorean notion of five as marriage.[111] In this testimony we also have 4 = receptacle and passive principle, 3 = active principle and origin and 5 = achieved perfection. The musical work *Excerpta Nicomachi*, Jan, *mus.script*. p. 279, relates this triangle with the *tetraktys* 6-8-9-12 (which we are going to study below) because of the addition of 35 of these numbers corresponds to the addition of the numbers in the triangle: 5 x 3 + 5 x 4 = 35.

Another important feature is that the musical system is based in both cultures in a tuning through fourths and fifths. In the Chinese system there is a pre-eminence of the fifth and it is mainly based in a series of fifths, which were identified with circularity and number 3, as we have mentioned above. There is no testimony in the sources of Ancient harmonics to prove that the Pythagorean scale was based only on a series of pure fifths (without referring to fourths and octaves), as it is usually presented in studies on tuning systems.[112] However, it seems that there are testimonies in other civilizations to say that the "cycle of fifths" is not just a modern conception, because we have Chinese written documents and even "material" bells tuned according to this procedure that prove the existence of this

[109] See Granet (1934), pp. 181 ff. There is a mythical account in which a male phoenix and its female partner give the 12 notes, six each, perched on the different sides of a tree. Cf. Needham (1956), p. 272. See also Granet (1934), pp.176 ff. and Laloy (1903), p. 39 and p. 45 where the author explains how the system is generated by intervals of fifth and was depicted by an author of the III century b.c. with the language of "begetting".

[110] Granet (1934), pp. 175-176 quotes Chavannes who claimed that Chinese musical theory had its origin in the mathematical theory of the Greeks.

[111] Five was the number that represented marriage, as a combination of even (female) and odd (male) numbers: 2 + 3 = 5. Cf. Burkert (1972), pp.467 and 475. On the musical significance of the triangle 3-4-5 see Arist.Quint. III.23

[112] See Barbour (1932 and 1951 pp.1 ff). We can say that the tuning system is based on fifths and fourths. Cf. the "method of concordance" in Barker (1989), p.33 note 22; p.49; p.60 note 18; p.168, note 111.

theory in Antiquity: the Chinese "Zeng Bells" belong to the 5th century B.C.[113] In this tradition it is clear that circularity is identified with the interval of fifth.

There is another aspect that is related to the circularity of the interval of fifth (which can include also the interval of fourth) and this is Archytas' notion of arithmetic proportion. According to Huffman's interpretation of testimony A23a (2005, pp. 516 ff.), Archytas theory of motion was based on mathematical proportions: "all things are moved in accordance with some proportion" (see 2005, p. 519). The continued geometrical proportion (e.g. 4:2 :: 8:4 :: 16::8) is analogous to motion in a straight line (see Huffman's diagram in p. 539) . On the other hand:

> The proportion of equality (i.e. the arithmetic proportion) defines natural motion, which is curved (A23a). The arithmetic proportion "bends back on itself" (A23a) in that its successive pairs of terms do not maintain the same ratio, as they do in the geometric proportion, but "turn back" to get progressively smaller (e.g. 2:1 > 3:2 > 4:3 > 5:4 etc.). Like the arithmetic proportion, natural motion turns back on itself and produces curves (Huffman, 2005, p. 520).

As we are going to study below, the structure of the octave is based on the harmonic and the arithmetic mean, which divide the octave in a fourth and a fifth.[114] In the octave expressed between the numbers 6-8-9-12, the arithmetic mean is 9; its proportion is "equal" because 9 – 6 = 3 and 12 – 9 = 3. We cannot know if Archytas' theory of motion was related to his harmonics, however it is interesting to note that number 9 is the arithmetic mean between 6 and 12 and it represents the interval of fifth (it also shows the interval of fourth between 9 and 12).

In the *Epinomis* 991a, Plato (or the author of this dialogue) identified number 9 as the arithmetic mean between 6 and 12 with the circular dance of the Muses:

> turning between these very two [between 6 and 12 and the fifth and the fourth on each side of the mean term], to one side or the other, this power (9) assigned to men an accordant and proportioned use for the purpose of rhythm and harmony in their pastimes, and has been assigned to the blessed dance of the Muses. (transl. W.R.M.Lamb)

It is also significant that the geometrical proportion is understood according to this background as a linear movement and it is characterized as increasing quickly

[113] See Picken and Nickson (2000), pp.185 ff. and Falkenhausen quoted there in p. 186.
[114] The Demiurge fills up the double and triple intervals with the harmonic and arithmetic means in *Timaeus* 35c.

in magnitude (see Caeneus in Huffman, 2005, p. 534); while the arithmetic proportion causes circularity and "bends back on itself".[115]

Both progressions of the *Timaeus*, the double and the triple are "multiple" and in continued geometrical proportion; however Proclus and Iamblichus consider the double (of even numbers) as representing linear procession and the triple (of odd numbers) as expressing return (see Proclus, *In Tim*.II.215.5-215.29). If one takes into account the opposition even-odd, then the odd is more similar to Limit and corresponds to return. However if we think of the geometric proportion, in itself, and as the source of both progressions, this return is possible because as the basic proportion and as continuous *apeiria* (infiniteness), it contains everything and gives continuity to the whole while it penetrates through all things, reaching the more distant things (*In Tim*. II. 52.5). The other proportions are needed for the sake of the binding of the geometric ratios, and in a sense are secondary; in another sense, since the "creation" of a multiple and divided sensible world has taken place, they are needed to bring it and bend it back towards its cause.[116]

In this sense, after the "creation" and "linear procession" (understanding the "after" metaphorically), for Proclus, the circular motion of Intellect makes return the creation with harmonic ratios and rhythm. In view of that, "rectilinear motion is brought about and sustained by circular motion" (*In Tim*. II.94.12) and circular motion corresponds to intellect and wisdom, proceeding according to one ratio (*logos*) (II.94.18 ff.; cf. also Plato, *Laws*, 898a8).

The interval of fifth (or at least the octave + fifth) and the triple progression can be identified with circularity, especially in relation to number 3 and the triadic.[117] It is well known that the Neoplatonic cycle is triadic, considering that three contains principle, middle and end. We can identify in a sense the number three, the triangle (see Plutarch above) and the fifth (3/2 = marriage) as a principle of generation of the musical scale; and particularly a generation that makes the generated return to its source through similarity; since the progeny (3) looks like

[115] See Hufmman (2005), p. 526 ff. on circular motion as the best motion and p. 531 ff, on the arithmetic proportion.

[116] See Proclus, *In Tim*.II.23.1, geometric proportion is more basic because it corresponds to "sameness", while artithmetic and harmonic proportion correspond to equality and similarity respectively. In this way the geometric sameness is what at the end makes possible the return by means of equality and similarity and "the ascent to unification goes by way of sameness".This shows indirectly that Huffman is right in interpreting the "proportion of equality" in Archytas A23a as the arithmetic proportion.

[117] See Proclus, *In Timaeum* II.222.29 ff., quoted below, p.112 (cf. II.204.21 ff.) for a clear association between the fifth and the conversion/return of the Soul.

its progenitors (2 and 1); we shall see below in which sense the fifth is related to number 3 and the triangle. The interval of fourth is of course also one of the more important features of the Greek scale, with its structure based on tetrachords. However, this interval is connected with, number four, the square and the feminine receptacle.

I may be over-emphasising the role of the fifth in generating the scale; in order to correct this one could say that the scale (and the octave) is based in the correlation between fourth and fifth, between the triadic, the tetradic, and the pempadic.

In the same way that in Chinese cosmology number three is identified with generation, for Proclus (*In Eucl*. 166.25 ff) the triangle represents the source of generation and according to a doctrine attributed by him to Philolaus, the angles of the triangle are devoted to four male gods. On the other hand, the angles of the square were dedicated to three female goddesses (*In Eucl*. 173.11 ff.; cf. 130.8).

This interrelation of a triadic tetrad and a tetradic triad shows the

> communion of all in all, of odd numbers in the even and of even in the odd (*In Eucl*. 174.6, transl. Morrow).

Proclus also connects the square with the earth and life-giving goddesses (generating causes in earthly fashion), which are creative (*poiêtikos*) and the triangle with the Demiurge and the generative cause (*gonimos*).[118] It is important in this context the fact that Ptolemy identified the interval of fifth with the triangle and the interval of fourth with the square, both inscribed in the circle (see Ptolemy, *Harm*. III.9.103-104).[119]

The generative character of number three and the triangle corresponds to the interval of fifth in the sense that dividing a string the interval of fifth (or octave +

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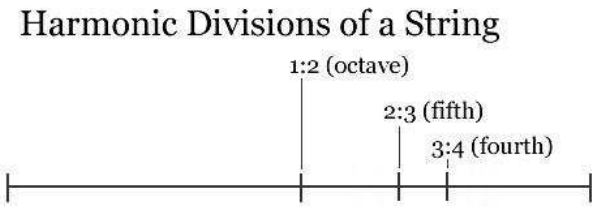
[118] Both the triadic and the tetradic are combined, according to Proclus, in the dodecadic (3 x 4 = 12), which corresponds to the encompassing totality, since twelve "ascends towards a single monad, the sovereignity of Zeus". The angle of the dodecagon corresponds to Zeus, who leads "the twelve" and governs all things, says Proclus referring to Plato's *Phaedrus*, 246ef. This is related to the Zodiac divided in twelve parts and according to Ptolemy "in all the arrangements based on the points making twelfth parts of the circle, there are only three species of squares, equal in number to the species of the concord of the fourth, and only four species of triangles, equal in number to the species of the concord of the fifth" (*Harm*. III.9.104). Ptolemy's musical connotations are similar to Proclus' account of the dedication of the angles to gods in Philolaus, in the sense that both combine the triadic with the square and the tetradic with the triangle.

[119] See Barker (1989), p. 383. Also the related angular aspects of the planets are: the opposition aspect is an angle of 180º = 1/2 of the ecliptic (360º); the trine aspect is 120º = 1/3 and the square is 90º and 1/4.

fifth) generates a new note in the division of the length according to 2/3 of the string; the fourth appears in the ratio 3/4.



When dividing a string it is probably easier to find first the half (1/2) and afterwards half of that half (1/4) and this gives us the octave and the double octave; however it is firstly with number three (and 2/3) that we find a new sound (the octave + fifth), which is an interval of fifth between number 2 and number 3, while the fourth appears afterwards in relation to number 3 (4/3). These two numbers that comprise the fifth, as we have seen, represent marriage and therefore are appropriate for portraying the generation of new notes. According to the mythical context of "generation" in Proclus' analysis of the *Timaeus*, it can be noticed that linear division can be pursued infinitely; according to a double geometrical progression that increases quickly and becomes identified with matter and the sensible world; on the other hand, circular motion recovers in that continuity a structure and a harmony among the divisions. Circular motion is identified with the motion of the heavens and Intellect (eternity).

The returning feature of the intervals of fifth and fourth, understood as above, brings the structure together back to the One, showing that the operation and function of the principle of harmony is to make one again what has been divided into multiplicity, which is the task also of the Soul in relation to body.

Numbers in movement; arithmetic turns into music

The musical notes that derive from the proportions that connect the numbers of the *Timaeus* express the cosmic derivation, as can be seen in the fact that the scale originates from the first note and follows in a descendant way, in the same way that light comes down from a source above.[120] The composition of the World-Soul

[120] The emanation of original light in the context of cosmic illumination (derivation) can be illustrated by a similar musical example: the opening motif in fifths and fourths of Beethoven's *Ninth Symphony*. Since we have identified the fifths and fourths with structure and the illumination

in the *Timaeus* can be understood then in relation to the Pythagorean theory of the flux of the dimensions, as the work of an Apollonian Demiurge that creates the world as a divine manifestation or illumination (which in Neoplatonic terms mirrors the illumination of the *Nous* on the Soul, and ultimately at a higher level, from the One at the top, which, identified with the Good by Plato and Plotinus, is represented with the Sun in the context of the *Republic*).

In the *Timaeus*, it seems as if the numbers were acquiring movement and producing an ideal or mathematical blueprint of reality within the Soul, starting from its first portion or Monad (*akron* of the Soul).[121]

Sextus Empiricus explained how the Pythagoreans based their cosmology on the geometrical progression (1-2-4-8):

> They say that the body takes consistency from the point; because this point sliding produces the line, the line sliding makes the plane and the latter moved in depth generates the three-dimensional body […] They construct the Universe starting from a point, because from this point the line is generated, from the line the surface, and from the surface the body. (*Adversus Mathematicos* X 281, II p. 360 Mutschmann)[122]

An important text in Aristotle's *De Anima* shows that the *Timaeus* was explained by Plato or his immediate successors in relation to the derivation of the dimensions (geometrical magnitudes) not only in the context of a cosmological explanation but also connecting them with the gnoseological faculties or powers of the Soul as well.[123] The progression in this case is that of the first numbers 1-2-3-4 (not the previously mentioned geometrical progression): The point (1) flows

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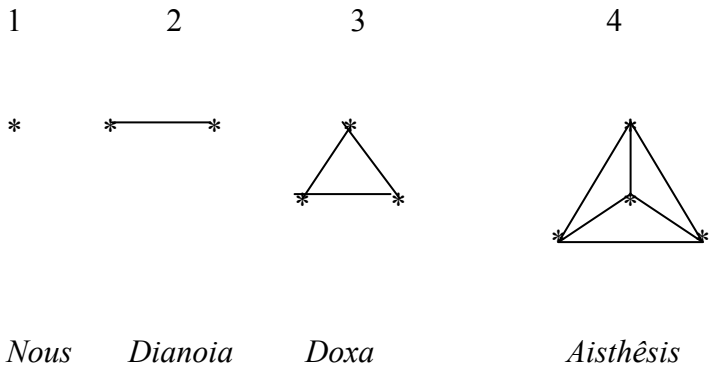
of the Intelligible and the principle of *peras* in combination to the indefinite principle of *apeiron* (in the same way that Yang is a principle of light and Yin is a receptive principle in Chinese cosmology), we propose this audible example, accessible to everybody, as an illustration of how musical symbolism functions.

[121] Plato is following here the Pythagorean cosmogony that, as Burkert (1972) has pointed out, was a development of the Pythagorean number theory and the doctrine that "number is 'harmony' not only in a general way, as that which transcends the opposition of Limit and Unlimited, but even more so on the basis of the recognition that all musical intervals are determined by numerical ratios. This music then moves out into the cosmic realm, in the idea of the 'harmony of the spheres'" (p.40).

[122] The progression can be understood as being 1-2-3-4 as well, cf. Burkert (1972), p.23 ff and 66 ff. for the Pythagorean origin of the doctrine of the flux (*rhysis*) of numbers and dimensions and the Platonic elaborations of it.

[123] *De Anima* 404 b 18 ff.: "and in the same way it was laid down in the work entitled *On Philosophy* that the Animal-itself is derived from the Idea of the One, along with the primary length and breadth and thickness, and the rest in similar manner. Again, putting it differently, the Intellect (*noûs*) was said to be the One, knowledge (*episteme*) two (because it goes in a straight line to the One), whereas the number of the plane figure is opinion (*doxa*) and that of the solid, sensation (*aisthêsis*). The numbers are expressly identified with the Forms themselves or principles, and are formed out of the elements; on the other hand things are apprehended either by intellect [intuitive knowledge] or science [discursive or rational] or opinion or sensation, and these same numbers are the Forms of things […] since the soul seemed to be productive of both motion and knowledge, some have compounded it of both …" As quoted by Burkert (1972), p.25, with modifications.

and produces the line (2), the line produces the figure (3) (a triangle), and the figure produces in turn the solid (8) (a tetrahedron or pyramid). Also in this case, the numbers show the boundaries (vertices) corresponding to each dimension:



Iamblichus used this Aristotelian text in his account of the powers of the Soul and developed an explanation that included all the numbers of the *Timaeus* (cf. Proclus *In Timaeum* II. 215.5 – 215.29). Iamblichus understood that the even numbers (1,2,4,8) corresponded to 'procession', 'potency' (*dynamis*), the principle of 'Unlimitedness' (*apeiron*) and 'Life'; the odd numbers (1,3,9,27) corresponded to 'Intellect', 'determination', the principle of 'Limit' (*peras*), and 'return' or 'conversion'.

These metaphysical principles, expressed in the mathematical language of numerical proportions, can be applied to both cosmology and gnoseology, showing the analogy between the inner world of the Soul and the outward cosmic manifestation; the inner mathematical plan of the Universe follows a sequence of derivation that makes possible the knowledge of the sensible world according to numbers and musical ratio, which in turn are images of Intelligible principles.

Huffman points out that

> Philolaus had been interested in how number and ratios accounted for the structure of the world, but that structure was largely viewed statically. Archytas takes a bold step further and accounts for another central feature of the world, its motion, in terms of mathematical proportion (2005, p. 522).

In a similar way, Diogenes Laertius (8.83) says that Archytas introduced the idea of movement into geometry and according to Burkert, Speusippus or Xenocrates may have taken the derivation sequence from Archytas.[124]

[124] See Burkert (1972), pp. 68-69 and Huffman (2005), p. 502.

Plato's pupils, from Speusippus to the Neoplatonists, will develop this theory of mathematical movement or procession that produces the dimensions of space, attributing generative dynamism and movement to mathematical being in correlation to the essence of the soul.[125]

The ontological derivation sequence is related to the soul's nature, closely associated to mathematical being and the sciences that study the mathematicals; in this way reality proceeds from the soul's *dianoia*, through intermediate faculties, towards *aisthêsis* producing the sensible world afterwards.

Archytas classified the Mathematical sciences in four "sister" sciences (Fr.1 DK): arithmetic, geometry, music (harmonics) and astronomy.[126] It is relevant to quote here Plato's *Republic* VII 530d, already mentioned above (p.9), because it shows a similar doctrine to that of Archytas and also calls music and astronomy "sister sciences". The Pythagoreans combined music and astronomy as sciences that study the same objects as arithmetic (*poson* in itself and unmoved) and geometry (*pelikon* in itself and unmoved) respectively, but in movement and relation:

> I think we may say that, just as our eyes are made for astronomy, so our ears are made for the movements of harmony, and that the two are, as the Pythagoreans say, and as we should agree, Glaucon, sister sciences. (transl. Desmond Lee)

The "sisterhood" of the sciences makes possible the Pythagorean theory of the Harmony of the Spheres, which was revived by Proclus when commenting on the *Timaeus*. He considers this doctrine in its symbolic (metaphysical) sense and not in a literal sense; the planets sing and make a vibration and accordingly they are the first manifestation of music, but it is still a different kind of music, not yet the human type. Proclus in his short work *On the Hieratic Art* (*De Sacrificio*) states that there is a metaphysical analogy between what is below in the earth and what is above, in the Heavens. He explains that a cosmic sympathy and similarity between the lower and the higher connects everything in the universe, in an invisible way. For example there are flowers that move and open in consonance with the Sun, and Proclus says that their petals are like their lips and their movement that produces a vibration in the air is like a hymn to the Sun, to which this flower is connected with a natural kinship (*hêliotropion* = it moves in

[125] Cf. Burkert (1972), pp.69 ff and Merlan (1968), pp. 192-193. Cf. also Ptolemy, *Harmonica* III 3, p.94, 15-20 Düring, quoted and commented on by Merlan (1968), p.89.
[126] See Archytas, Fr. 1 in Huffman (2005), pp.103 ff. Cf. also pp. 114 ff, especially 119-21 and Burkert (1972), p. 422.

sympathy with the Sun).[127] The same can be said about the higher level; it is not only the case that the higher is present in the hymning lower (as image, *eikonikôs*), the lower, also, is present in the higher (in a paradigmatic way = *paradigmatikôs*), which also "sings". According to Iamblichus, when Helios' light moves in the Ether, the enveloping rays of light transmit a vibration to it and make a sound (*rhoizos*), and the same applies to the other stars and planets.[128]

One can understand then, why all these numbers are tied and harmonized in a hymn, or something that is like a music, a paradigmatic one, even when it sounds in a different mode. This is possible and necessary because numbers and mathematical realities are still not the First Reality, and in the proper chains (series of degrees of existence), everything chants the Hymn of praise of the Principles which are higher until the One, which is surrounded by Silence as an expression of the non-manifested.[129] However, at the same time since the One is the Principle that produces all the different kinds of Music in another sense it can be said that it is surrounded by a great Symphony.

In this context we can understand the quietness of arithmetic and geometry, which study quantity and magnitude in an absolute and motionless way, and music and astronomy, which study the same subjects but at the moment that they start sounding and moving, in the relation of harmony and proportion that makes the sensible cosmos.

The four sciences of the *quadrivium* can be found in the *Timaeus*, and a cosmic derivation of their objects is represented in the progression of numbers, because they start as numbers, but "develop" as geometrical figures, musical notes, orbits of the planets, and the physical elements (fire, air, water and earth) are described in a geometrical sense as well (*Timaeus* 31b – 32c).

Arithmetic and geometry mirror the immutable quality of the Intelligible (represented in the Decad that is contained in the Four first numbers in the *tetraktys*, as we shall see) and in the Geometric progressions that compound the two series (double and triple) of the numbers of the Soul. Music is necessary to relate and harmonize the discrete numbers of the Soul and astronomy is needed because the movement of the planets and the whole Heaven are ruled by the same proportions contained in the Soul. The number leads us to a musical scale, the

[127] Cf. *On the Hieratic Art*, 148.10. Cf. pp. 227 and 260 below.
[128] See Shaw (1995), p.176; cf. pp. 89 and 91.
[129] Cf. Schroeder (1992), p.40 ff., on the topic of silence in Plotinus.

order of which has a mathematical foundation based, according to Plato, on three kinds of proportions studied by Archytas in his musical texts: geometric, arithmetic and harmonic. The sciences are mirrored also in these three kinds:[130]

The musical scale contains: geometric, arithmetic, harmonic } proportions/means

Plato, then introduces in the continuous geometric proportion two means: the arithmetic and harmonic means. We are going to treat this in a more detailed way later; for the moment we can introduce the mentioned means in the double and triple progression, to see how they connect the geometrical progressions, thus creating even more continuity and harmony in an already proportional series:

1	4/3	3/2	**2**	8/3	3	**4**	16/3	6	**8**
	HM	AM		HM	AM		HM	AM	
1	3/2	2	3	9/2	6	9	27/2	18	27

The scale of the Timaeus and intelligible Life

The numbers of the progression of the *Timaeus* are like a scheme of the whole reality within the World-Soul and they are combined together composing a musical scale. The Neoplatonic revival of Pythagoreanism considers numbers in a different sense than our common view would understand them. In this sense numbers are not only the numbers of common calculation, they are related to geometry and harmonics and they point out towards a metaphysical reality; they are not just quantities without relation to quality: numbers are symbols of the Platonic Forms and they are considered paradigms of quality and order.[131] Numbers are more than a lifeless plan of reality or an abstraction, they are in a Pythagorean sense the transcendent source from where all immanent life is

[130] Cf. Archytas F2, Philolaus A24 and Plato *Timaeus* 35 b 1 ff.; see Burkert (1972), p.440 ff. and Huffman (1993), p. 168. Cf. also *Epinomis* 990 d, where Plato or the unknown author of this dialogue related types of sciences and types of proportions.
[131] Cf. Proclus, *In Tim*. I.8.14.

derived as a stream from a "fountain" (*pêgê*) or from a "root" (*riza*);[132] and this life present in an invisible way in all things can be understood as "music" according to Proclus version of Pythagoreanism.[133] Since in the *Timaeus* the universe is depicted as a living being, if the immediate cause of life — which is the World-Soul — is depicted as having an essence or nature based on numeric proportions and harmony, these notions have to contain life in some way.

Proclus connected life with proportion (*In Timaeum* II. 24.5 ff.) and since life is the cohesive activity of Soul and Intellect (that are the higher "spheres" that contain within themselves the spheres of the sensible world)[134], proportion in general was related to the "geometrical" proportion (*analogia*) which is the basic one that was known as "continuous", showing the continuity and sympathy of the universe, between all the spheres. The use of the metaphor of generation in the plane of numbers points to an understanding of mathematics related to an intelligible life, because only living realities can generate offspring. All this is included in the mythical consideration of the World divided into male and female principles. The Pythagorean/Neoplatonic theory of number does not consider its nature without connection with the metaphysical complementarity between male and female that is present elsewhere in the universe, as we have seen. Furthermore, we have already mentioned that this complementarity is based on the principles of number: *peras* and *apeiron*.[135] Hence, the principles of number are the principles of everything that falls in these two main categories. "Pythagorean" arithmetic, as we mentioned above, has the particular characteristic of having quality (and also a spatial representation in geometry, taking into account that different regions or sections of space are related to specific gods, male and female, and other regions to others, which are the ideal sources of qualities in the sensible world that is under their care).[136] This is in particular

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[132] The Pythagorean *tetraktys* is usually depicted as "the fountain and source of the eternal nature" (*Carm.Aur.*47-48, cf. Theon of Smyrna. *Exp*. 93 ff. H.; Hierocles, *in Carmen* Aureum, 87.16-89.18, Köhler). We are going to study the musical meaning of the tetraktys in the following section.

[133] See O'Meara (1989) on Proclus' notion of a cosmic life that penetrates the world according to mathematical proportion.

[134] At least in a metaphorical understanding of space, because being immaterial they are nowhere and everywhere.

[135] Cf. Cornford (1939), p.19.

[136] Cf. Proclus' testimony (*In Euc*. 130.8, 166.25, 173.11, 174.2) on Philolaus' doctrine of the dedication of the angles of the square and the triangle to masculine gods and feminine goddesses, that is related to astrology (according to Burkert (1972), p. 349) and the geometrical relation between the planets and the signs of the Zodiac (Philolaus A 14).

contrast to a quantitative and abstract conception of mathematics like the modern which considers all numbers without any qualitative difference.

We can understand then why the number four was closely related to the idea of life, because the cycle of the year and the generation of natural beings was divided into four seasons, and the space was also in correlation to that rhythm, since it can be divided into the four directions of the compass.

Plato's doctrine of the fourfold Intelligible Living Being in the *Timaeus*, has to be understood in this context of qualitative understanding of the number four.[137] Since the World-Soul is made by the Demiurge with this tetrad as its model, we should be able to find it present in the explanation of the musical account of the composition of the Soul. In order to show how the numbers flow from the unity generating the World according to qualitative principles (Ideas or Numbers) that are expressed as well in musical notes, we shall consider first the first four numbers, which combined together form the decad: 1+2+3+4= 10; then continue the explanation with another group of four numbers 6-8-9-12 that add up to 36 (if we include the unity of the musical tone: 35+1); and we shall finish this section studying the whole series 1+2+3+4+8+9 = 27 that contains the previous numbers conforming to a musical scale represented in the numbers 1-2-3-4-6-8-9-12-16-18-24-27. In order to explain how numbers can represent musical notes we shall start with the first group of numbers that was known as *Tetraktys*.

The Tetraktys

The Pythagorean school considered the *Tetraktys* one of their more sacred and valuable teachings about number. *Tetraktys* means in general a "group of four things", "quaternary" (*quaternarius* in Latin) or "tetrad" (as Hierocles understands it).[138] The main *Tetraktys* is as well the number ten considered as "triangular number", composed of the first four numbers unified as a tetrad that contains in its cohesive power the decad because: 1 + 2 + 3 + 4 = 10. The decad presented in this

[137] Proclus quotes a Pythagorean *Hymn to Number* in his *In Timaeum*, I.316.17, where the "procession of divine number" is depicted: from the Monad, to the Tetrad and after it the Decad. The Decad is called in the hymn, Mother of all things and Universal recipient (*pandechea*). This can give an idea of how life is related to these divine numbers. Proclus (*ibid.*) and Syrianus (*In Met.*106.4, referring to the same *Hymn*) identified the Decad with the model of all things in the demiurgic Intellect: the Ideas (Forms) considered intellectually and decadically (*noerôs kai dekadikôs*) (Syrianus, 106.15). The Decad emanates from the Tetrad, identified with the animal itself that contains all the Ideas, intelligibly and tetradically (*noetôs kai tetradikôs*). The Tetrad in turn comes from the paternal Monad. Cf. A.Delatte (1915), p. 208 ff.

[138] Cf. *In Carm. Aur.* XX, 45-8.

fourfold form was a symbol in which the key of the Universal Harmony was concealed and constituted a solemn oath:

> No, I swear by him who transmitted to my soul the *Tetraktys* in which the fountain and root of the eternal Nature lie.[139]

The *Tetraktys* epitomizes the Pythagorean conception of number as cause of the arrangement of the World because it contains the source of the Cosmic Harmony understood in musical terms. Plato's numbers in the *Timaeus* are a double *tetraktys* that encloses the source of the World-Soul and its musical scale. The Platonic *tetraktys* also includes the Pythagorean *tetraktys* in the first four numbers. The first numbers that correspond to the decad (1-2-3-4) can be seen as the intelligible model of the World-Soul reflected itself in the World-Soul.

Proclus, following Syrianus, in his *In Timaeum* I. 432.16 ff. identified the tetrad with the Intelligible Living Being of the *Timaeus*, which is the Paradigm of the order of the Universe, and the decad with the Demiurge.[140] In this sense the decad, as an actualization or manifestation of the enclosed potentiality of the tetrad (cf. *In Timaeum* I. 432, 19-23), is a more expanded model for the creation of the World contained in the Demiurge. Another possible correspondence can be pointed out. Since the relation between these principles (the tetrad and the decad, or the Paradigm and the Demiurge) can be mirrored down in the manifested world, the following is appropriate too: everything in the Intellect pre-exists in monadic manner, the soul participates in harmony in the manner of a tetrad, and the cosmos in the manner of a decad (*In Timaeum* II. 207.26). Both the tetrad and the decad are contained as well, potentially, in the transcendent Monad, which is the first principle of number that contains everything (and the even and odd) as in a seed and that proceeds firstly to the coordinated pair of principles: monad and dyad. The monad corresponds to "essence", the tetrad to potency and the decad to activity. This analogy implies three levels of harmony:

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[139] Aëtius, *de plac*. I, 3, 8, Sextus Emp. *Math*. 7.94-100 and 4. 2, Theon Smyrn. 87.5 ff., 93.17 ff, Iamblichus, *Vita Pythagorica* 150.16 and 162.17, etc. Cf. Burkert (1972), p.72 and 186 ff. and Delatte (1915), 249-268 "La Tetraktys Pythagoricienne" for the different versions of the oath. Proclus quotes the *Carmen. Aur*. verse 47: "source of ever-flowing nature" about the *tetraktys*.

[140] Cf. O'Meara (1989), pp. 136 ff. According to Syrianus, the Ideas are present "intelligibly" and "tetradically" in the Ideal Living Being, and "intellectually" and "decadically" in the demiurgic intellect. Proclus, from another point of view compares the soul with the Hebdomad (because it contains seven portions or main harmonic divisions) and the Demiurgic Intellect with the Monad, in *In Timaeum* II. 203.1 ff. A possible combination of both analogies can be considered if we consider that number 7 is the arithmetic mean between 4 and 10. On this doctrine in Hierocles, see Hadot, I. (2004), pp. 63 ff.

> And just as the monad is the cause of the tetrad, and the tetrad in turn is the cause of the decad, in the same manner the intellectual harmony provides it to the psychic harmony, which in turn conveys it to the harmony of the sensible realm (*In Timaeum* II. 207. 28-30).

In the context of the *Timaeus* then, the Demiurge contemplates the Paradigm, the tetrad, and also he looks to himself (because as demiurgic Intellect he contains in another sense the Paradigm in himself, *In Timaeum* I. 431. 30 ff.). In the demiurgic intellection the decad takes part in the creation of the World-Soul that will be the source and archetype of order for the physical world, and the World-Soul itself depends on the paradigmatic numbers that are contained in a concealed way in the Intellect (the Demiurge).

In this process of diffusion and unravelling from the principle, the unity is considered simple and the numbers that are closer to the unity are more similar to its simplicity, hence the consideration of tetrad as potency and decad as actuality (*In Timaeum* I. 432. 20 ff).[141] Proclus in his *In Timaeum* I. 17-18, connects the *tetraktys* with the principles or three causes understood as monad, dyad and triad, which are considered as final cause, paradigmatic cause and productive cause:

> The final [is shown] through the monad, for it stands at the head of the numbers at the level of the Good. The paradigmatic [is shown] through the dyad, for the otherness between intelligibles is what distinguished the primary causes of the universe, and furthermore the dyad is the starting point of the *tetraktys* of intelligible paradigms. And the productive cause is shown by the triad, for intellect is related to the triad, being the third from reality with life as intermediate, or from the Father with potency as intermediate, or from the intelligible with intelligence as intermediate. For by analogy, as is monad to dyad, so is being to life, Father to potency, and intelligible to intelligence. And as dyad to triad, so is life or potency, or intelligence, to intellect. Moreover all things divine are in all things, and they are unified by one another, so that all are in one and each is in all and they are held together (*synechesthai*) by divine friendship. (I. 17.19-18.02)[142]

Since divine friendship is as well divine harmony, therefore we shall find these principles in the musical scale: a) the essence at the top (reflected in the first term but also in the whole extension until the other extreme, which shows the essential unity of the scale depending on a transcendent cause of harmony), b) life, reflected in the double progression, and c) intellect in the triple progression.

In the *Timaeus* the derivation goes farther than the decad and continues, according to the progressions, until the numbers that represent the physical

[141] On the tetrad as *dynamis*, and the decad as *entelecheia* or *energeia*, see Schibli (2002), p. 279 ff. This author explains that "these Aristotelian distinctions are, however, inverted by Neoplatonic authors in the sense that for them the idea of potency carries a reality that is ontologically superior to act […] the decad is an emanation of the tetrad."

[142] This triadic distinction corresponds to the three causes of the cosmos: Goodness, the Intelligible Living Being and the demiurgic Intellect, which give three gifts to the world : embracing unity, divine soul and perfect intellect. Cf. *In Timaeum* I. 414. 8 ff

bodies, because, according to the Neoplatonic interpretation, the series of numbers represent all the levels of reality: the Intelligible, the World-Soul and the visible World.

It is important for our topic to take into consideration the Platonic-Pythagorean number symbolism because as we shall see later, the same numbers indicate levels of the universe in the musical scale of the *Timaeus*. Since this scale stretches as a straight line, it is capable of symbolizing all these levels from the Ideal — represented in the two octaves 1-2-3-4 — to the material world and Earth — represented by the number 27 — with the World-Soul and the Spheres of the Planets in the middle and intermediary succession of musical intervals.

The account of the tetrad and the decad then, requires a connection with the development of the dimensions of space and with music and harmony as well, because the first four numbers that compose the decad are the terms that form the main ratios of the musical intervals. Harmony is the way of relating the discrete numbers and making them again similar to the simplicity that they had in the potential unity of their principles, according to the tetrad and the monad.

The decad as a "triangular number" combines the quaternary with the ternary, as can be seen in the schematic representation that the Pythagoreans made of it with pebbles:

```
        *          1
      *   *        2
    *   *   *      3
  *   *   *   *    4
                   10
```

The representation of the Decad in a triangular way is similar to the schematic way of presenting the numbers of the *Timaeus* in a *lambda*, both showing a derivation from the one at the top (see p. 43 above). It can be noticed that the figure has the one at the top and goes down to two and the following numbers and

dimensions; the same happens in the Platonic *lambda* but in a combined way, with the double and the triple.[143]

The Decad was for Pythagoreanism a symbol of the Whole or Universe (*to pan*)[144], and contains the causes of all the geometrical and physical dimensions in its cosmogonic function, as can be seen in a testimony attributed to Philolaus that names it: "*megala*, *pantelês* and *pantoergos*."[145]

The Pythagoreans saw in the *Tetraktys* the Source (*pêgê*) of Harmony both in a musical and cosmic sense,[146] which is a characteristic that can be supposed in the oath already mentioned, if we relate it with one of the Pythagorean *Akousmata* found in Iamblichus (*Vita Pyth*. 82,13)[147] :

> —What is the Oracle of Delphi?
> —The *Tetraktys*; that is, the harmony in which the Sirens sing. (transl. Burkert)[148]

This testimony connects the Apollonian aspect of the creation of the world (providence and divine knowledge understood as planning the world) with the Harmony of the Spheres, since Plato depicts this Pythagorean doctrine in the Myth of Er as the *symphonia* of the singing voices of eight Sirens (*Republic* 617c - d)

In the context of the *Timaeus*, where cosmic music has its foundation in the harmony of the World-Soul, then we can expect that the numbers of the *Tetraktys*, which represents the source of the harmony of the Spheres, may be included in the mathematical ratios or proportions that establish the main intervals of the musical scale of the Soul in a causal way.

The three Tetraktyes

As we suggested before there is not a single *Tetraktys*, but according to the Platonic tradition (Theon of Smyrna, *Expos*. 93.17 ff.), there were other *Tetraktyes* beside the one that corresponds to the Decad (which is the model of the order of the world). According to Calcidius (*In Timaeum*, 36 and 38) there are

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[143] Both the representation of the *Tetraktys* and the *lambda* of the *Timaeus* have the original Monad on top.
[144] Cf. Iamblichus, *Theol. Arith*. 59-60.
[145] Philolaus fr. 44 B 11 DK (*Apud* Stobaeus *Ecl.*, I *proem. Cor.* 3).
[146] Cf.Theon of Smyrna, *Expos*. p. 94, 7 (Dor. *pâga* = *pêgê*).
[147] Cf. A Delatte (1915), p. 259.
[148] Burkert (1972), p. 187.

three main *Tetraktyes*: the first one is the number ten, the second is made of 36 and the third is precisely composed by the numbers of the *Timaeus*, which we have depicted above.

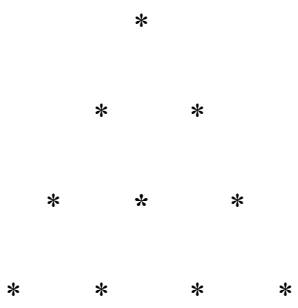
Plutarch (*De Is. et. Osir.*,75 and *De An. Procr.*, 11, 1 and 14, 5) also mentions two *Tetraktyes* that are double: the Pythagorean composed by the first four even numbers and the first odd numbers, that adds up to 36:

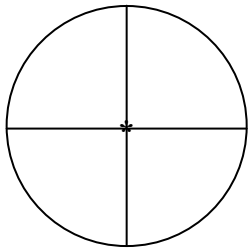
2 + 4 + 6 + 8 + 1 + 3 + 5 + 7 = 36

and the Platonic one that corresponds again to the numbers of the *Timaeus*:

1 2 4 8 and 1 3 9 27

In this group of numbers the relation to the number 9 is very important because both 36 and 27 are multiples of 9, and in the case of the series of seven numbers of the *Timaeus* the first ones up to 9 amount to the last that is 27 (1+2+3+4+8+9 = 27). If we add 3+6 and 2+7 (that compose 36 and 27) we obtain 9 again, which is a characteristic shared by the numbers that represent cycles, that we shall study later. It is well known that the circumference is divided by multiples of 9, because the quadrant is a right angle = 90º, the whole circle being 360º = 90º x 4. In this case the representation of the decad as a perfect number is the circle because 9 + 1 = 10 (nine represents the circle and 1 the centre).[149] In the traditional symbol of the *tetraktys*, the same can be represented with the pebble in the centre as the unity and all the others in the perimeter of the triangle, which are 9 in number:





The quaternary aspect of the decad is seen in the circle in the crossing diameters, while in the *Tetraktys* the quaternary is represented by the number 4.

[149] Cf. [Iamblichus ?], *Theologoumena Arithmeticae*, 76.16, about the relation between the number 9 and the circle in the section dedicated to the number 9. Cf. also Aristides Quintilianus, *De Musica*, III, 6 (102.16 ff. and 112.15). On Aristides Quintilianus' sources, such as Theon of Smyrna quoting Philolaus and Archytas, see Barker (1989), p. 503, note 47.

The centre is in both schemes the unity and the surrounding cyclical number is nine. In the circle the number nine is represented by its multiple 360. Number 9 has musical connotations because it is the arithmetic mean between 6 and 12, demarcating the relation between the fifth and the fourth.[150] It is interesting to notice that the account of the order and distances of the planets in Plato's *Republic* 616e – 617b is arranged according to a symmetric scheme of numbers that add up to 9, which can be interepreted musically as intervals of fifth.[151] Again in the astrological order of the planets in the days of the week, the arrangement is based on returning or cyclical fourths or fifths.[152]

The relation between the central unity and a periphery organized according to number 9 (fourth + fifth) can be expressed in the musical scale in this way:

A	B	C	**D**	E	F	G	A'	(letter notation)
La	Si	Do	**Re**	Mi	Fa	Sol	La	(with the names for the solfeggio)

ABCD is the interval of fourth

DEFGA is the interval of fifth

The centre of the scale is equivalent to the the centre of the circle.[153] Although we are presenting an octave A-A, we are aware that the notes would be better

[150] In moderm music theory it is well-known that number 9 helps to find the inversion of an interval: the inversion of a perfect fifth is a perfect fourth (9-5=4). Although, ancient Greek music theoreticians did not add the fourth and the fifth in this way (4+5 = 9), it is relevant to consider that the arithmetic mean 9 and the fouths and the fifths can be linked to circularity in tuning systems, as explained above.

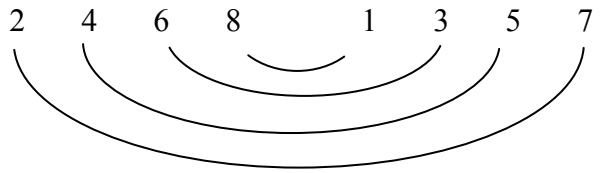
[151] Cf. Jowett and Campbell's commented edition of the *Republic* (1894), note written by W.A.Craigie by (Vol.3 p.475 ff.). Cf. also Mourelatos (1987), p. 104-105, note 33, and the bibliography quoted there, including several studies on this topic by Cook Wilson and Brumbaugh. See also Adam's edition of the *Republic*, Vol. 2, p. 473-475. These authors do not mention the possibility of interpreting the arrangement in a musical way.

[152] Cf. Dio Cassius's *Roman History*, XXXVII.18-19, who mentions the interval of fourth as the originator of the order of the week in the first of his explanations of the planetary days. Cf. *Brind'Amour* (1983), p. 263. See Proclus, *In Remp*.II.190.29-191.10 on ordering the days of the month according to number seven, which "engenders time". It is interesting to notice that the numbers of the ratio of the fourth 4/3 add up to 7.

[153] The note D is the central note in the Gregorian Church modes and in the scale attributed to the planets corresponds to the Sun as we shall see later; Ramis de Pareja, Renaissance theoretician, says that the Moon is Hypodorian and the Sun is Dorian, see Haar (1998), p.85. In Ambrosian chant and later in Gregorian chant the musical modes (or scales) were written in ascendant direction, probably to represent the ascent of the soul to heaven through the spheres of the planets. It is a much-debated question if the scales and modes of ancient Greek musical theory were written or understood in ascendant or descendant order. West (1992) p. 192 and Chailley (1979), p.28, mantain that scales were considered descendant.

represented as running from E to E, with A as the 'centre'.[154] The Dorian E-E octave is standard, and we are going to see below that the *Timaeus* scale can be interpreted as starting from E. However, in this case we preferred the octave A-A because this one was another standard octave for the notes of the "harmony of the spheres", based on Boethius' interpretation of Cicero (*Inst.Mus.*1.27), well-known in the Middle Ages and Renaissance.[155] We shall see that it is possible to argue that the second part or last half part of the *Timaeus* scale can be treated as this planetary scale, which is not an invention of ours because Ramis of Pareja and others present this cosmic double octave A-A-A + G (this G is usually written as a greek *gamma*) with planetary correspondences and Muses, etc.. Zarlino presents the double octave + tone with the *Timaeus*' numbers, those used by Proclus and Timaeus Locrus, and depicted it as the Pythagorean diatonic. While we don't mean to present Zarlino as evidence for Proclus, we just wanted to show how this planetary octave is better understood as A-A, in order to keep it in this long tradition from Boethius to Zarlino, which includes the explanations of the *Timaeus* scale, with its additional tone (G) after *proslambanomenos* = A = Moon.[156]

It is also interesting to notice that the numbers that add up to 36 form a symmetrical scheme based on the addition of 9 four times because: 9 x 4 = 36. It can be noticed in the diagram below that each pair of numbers, from the outside to the inside adds up to 9, combining the first four even numbers with the first four odd numbers in a symmetrical figure. This arrangement helps to understand the harmony of the spheres in Plato's *Republic* 616e ff. This is a complex topic which we cannot go into here, but merely wish to point out the pertinency of this scheme to understand the order of the planets in the Myth of Er:



[154] The octave E-E gives the standard pattern of intervals between *hypatê mesôn* and *nêtê diezeugmenôn*, the paradigmatic octave for theoreticians; and *mesê* (in this case A) was regularly treated as the foundational note of the series. See Barker (1989), p.18.
[155] See Haar (1998), pp. 84-85 on Ramis of Pareja use of Boethius interpretation of Cicero's scale of the harmony of the spheres, and the sources quoted there.
[156] See Renaissance diagrams pp.145-146 below.

The number 9 is very important in musical considerations as also are the numbers 10 and 36, which were in Pythagoreanism considered as two *Tetraktyes* that played an essential role in music as Delatte pointed out.[157] Number 9 is included in another musical *Tetraktys* that can be identified with the one that corresponds to 36 according to Chalcidius and Plutarch. Nicomachus of Gerasa says that the *Tetraktys* is the source (*pêgê*) of harmony because it contains the numbers 6 , 8 , 9 , 12.[158] These four numbers add up to 35, but as Delatte shows (commenting the work on musical theory *Excerpta Nicomachi*, 7),[159] this musical progression is related to the *Tetraktys* that adds up to 36, because if we add the unity (1) represented in the musical tone in the ratio 9/8, the result is 36.[160]

Nicomachus (or the unknown author of *Exc. Nicom.*), in chapter 7, p.279, identifies this *tetraktys* (6-8-9-12) as the one that gives us the ratio of the tone; the other tetraktys (1-2-3-4) expresses all the other consonances. The author bases his analysis in two significant numbers (from the point of view of Pythagorean numerology: the "perfect" numbers 28 (27 +1) and 36 (35 +1). In both cases the "monad" is understood as the principle of unity in the Universe. He explains that 35 corresponds to the triangle used to explain Pythagoras' theorem (the triangle 3-4-5 and 3 x 5 + 4 x 5 = 35), plus a unity that corresponds to "the principle of all things" (279.8). This monad, as the additional unit that makes 36, is proper to the sphere of the fixed stars and is the key of the knowledge of being (282.13 ff.).

We have seen how the *tetraktys* (10) had a central unity; in the case of 6 8 9 12, the central unity is between 9 and 8 which in this case expresses the ratio of one tone.

According to the testimony of the *Exc. Nicom.*, the musical intervals are unified in a totality identified with number 36; we shall see that for Timaeus Locrus, this number has an important harmonic significance because the cosmic musical scale as a whole is composed of 36 terms.

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[157] (1915), p. 257 ff.

[158] On these numbers see also Arist. Quint. III, ch.'s 12, 18, 23, and cf. n. 29 on p. 500 of Barker (1989). Cf. also Plato, *Epinomis*, 991a.

[159] *Mus. Script.*, Jan, p. 279. The four terms (6:8:9:10) of the proportion corresponding to the chief musical intervals, show the ratios with whole numbers and serve to avoid fractions. See Levin (1993) p.16 on the origin of this treatise.

[160] Cf. also [Iamblichus ?] *Theologoumena Arithmeticae*, 47, where it is said explicitly that 6, 8, 9, 12 together with 1 as the common source or monad, add up to 36. Cf. also Proclus *In Remp*. II. 34, 25, where 35 is considered as composed by 6, 8, 9, 12 in the context of an arithmological explanation of human begetting attributed to Empedocles.

The tetraktys 6-8-9-12, with the additional unity, shows that harmony is the result of the unification achieved under the influence of the principle of Sameness (*Exc.Nicom*. We find again this unifying quality of number 36 in another *tetraktys*, the double one mentioned by Plutarch (see above, p.64):

$$2 + 4 + 6 + 8 \quad + \quad 1 + 3 + 5 + 7 \quad = \quad 36$$

We can say that both *Tetraktyes* (Plutarch's and Nicomachus') can be combined and understood in relation to the number 36, because the unity that is lacking to add up to 36 in Nicomachus' numbers (6+8+9+12 = 35) can be found in the principle which makes a whole from different elements. This unifying principle can be understood as being present in a surrounding nature (e.g. the principle of Sameness and the sphere of the fixed stars mentioned by the *Exc.Nicom*.) or in the harmonic structure of the octave. The musical centre of the 6, 8, 9 12 octave is, mathematically speaking, the harmonic mean between 12 and 6, i.e. 8 (*mesê*). Since the octave cannot be divided exactly in a two, but into an interval of fifth and an interval of fourth, the other possible way of thinking of the middle of the octave is the arithmetic mean 9. Both numbers, related by the ratio 9:8 express the tone, which shows the structure of the octave understood as a tone between two disjunct *tetrachords*.[161]

Summarizing, there are three *Tetraktyes* that will help us in finding the structure of the musical Scale of the World-Soul:

1) The Decad.
2) The addition of 36 according to Plutarch and Nicomachus (with an additional unity).
3) The progression of the *Timaeus*.

If we remember that the tetrad and the decad are related by Proclus with the Demiurge and the intelligible model of contemplation, which he contemplated in order to create the World and its Soul, we can see that there are arithmetical, geometrical and astronomical representations of these metaphysical notions, because the decad and the tetrad depend in all these sciences on the One at the top

[161] See Barker (1989), pp.97; 171.

or at the centre, which is the origin of the procession of the levels of reality and also of the levels in the hierarchy of sciences. This centre can be represented with the Monad, the centre of the circle, or a musical note, which corresponds in the scale of the harmony of the spheres to the Sun. In the Greek musical system this note is the *mesê*, mentioned above (cf. Nicomachus, *Ench*.242).[162] The Sun is the centre in an astronomical sense, because it occupies the middle position and is like the heart of the Universe.[163] The Demiurge and the Soul in its demiurgic role correspond to the Sun, the centre and the top. The central position also corresponds in the analogical arrangement of the sciences to arithmetic, which comes at the beginning and at the end of the curriculum of studies, because the highest Pythagorean philosophy contains the relation between numbers and Ethics, Physics, Metaphysics, and culminates with the Theology of Number,[164] which is related to another kind of Sun over the heaven of the fixed stars, called Empyrium.[165] It is logical then that arithmetic as the central mathematical science corresponds to the Sun and the central sound D (which is also the central tonality of Beethoven's Ninth).[166]

A	B	C	**D**	E	F	G	A'
Grammar	Dialectics	Rhetoric	Arithmetic	Music	Geometry	Astronomy	Philosophy
Moon	Mercury	Venus	Sun	Mars	Jupiter	Saturn	Heaven of Stars

The *Tetraktyes* mentioned are the same three mentioned by Calcidius in his commentary on the *Timaeus* quoted before. It can be noticed that each one corresponds to one of the Circles of Reality, if we think of the metaphysical levels as concentric around the One, as Proclus does in his *In Timaeum*:

[162] Cf. Barker (1989), p. 252.
[163] Cf. Theon of Smyrna, *Expositio* Ch 33, 187.13-188.5 Hiller and Macrobius, *In Somnium Scipionis*, I, XX, 6. Cf. also Proclus, *Hymn to Helios*, 5 ff and Julian, *Oratio* IV, "To the King Helios", 134b.
[164] Cf. O'Meara (1989), p.18 ff. for Nicomachus' analogical parallels between mathematical and ethical and metaphysical principles.
[165] Cf. the hierarchy of sciences in correspondence with the "heavens" of the planets and the stars, etc. in Dante, *The Banquet*, Book II, XIII, 1 ff.
[166]The octave E-E, with a central note A (*mesê*) would be more appropriate to illustrate authors such as Nicomachus, etc. However, we prefer the octave A-A (centre D), for the reasons stated in pp. 65 ff. above. According to this we are taking into account the influence of Neoplatonic interpretations of planetary scales from the Middle Ages to Renaissance.

1) The Decad or main *Tetraktys*, or quaternary of the Principles that corresponds to the Circle of Noûs.
2) The *Tetraktys* that adds up to 36 that corresponds to the Soul (36 is the square power of 6, that is the number that generates the Soul according to Nicomachus *apud* Photius).[167]
3) The double *Tetraktys* of the *Timaeus* that contains the previous circles and *Tetraktyes* together with the Circle of the World, with the Harmony of the Spheres with the D as the central note (the Sun).

The next steps of our study will discuss each of the *tetraktyes* in relation to the musical scale. This is relevant because the musical scale is founded on the basic intervals represented in the ratios between 1-2-3-4.

1) *First Tetraktys 1+2+3+4 and the fundamental intervals of the scale*

Harmonia means in Greek "fitting together" and in a musical sense signifies in the first place an attunement of the strings and thus the musical scale, the octave especially, which comprises two tetrachords that are structures of four conjunct degrees (ascending or descending steps in conjunct motion).[168] The word "harmony" expresses the relation between the different notes, each corresponding to a number according to the interval's ratios. In the Pythagorean-Platonic theory, intervals are also thought of as "relations" between notes rather than "distances", and for this reason musical scales are like structural archetypes, which are exemplified in sensible or audible sounds. If one makes a mistake in music it is because the sensible sound does not accommodate to the model in a Platonic sense.

The relation between two notes is called "interval" (*diastema*) and is expressed with a numerical ratio (*logos*). According to the Pythagoreans the consonant intervals of the Scale are: the perfect octave, the perfect fifth, the perfect fourth, founded in the mathematical proportions contained between the numbers 1, 2, 3,

[167] Cf. Taylor (1816), p. 196. Cf. Ps.-Iamblichus, *Theol. Arith*. p. 40.41 Ast. or 52.14 De Falco [Aristoxenus fr. 12 W] about the cube of 6 = 216 as the "psychogonic" number. Cf also the role of 210 (6 x 35) in Arist. Quint. III.18, and see the reference to 216 in III.23. On number 6 and the Soul see Proclus, *In Tim*. II.95.

[168] A tetrachord is composed of four notes ('degrees'), but at the same time it comprises only 3 intervals ('steps').
Cf. Barker (2007) and Huffman (1993), p. 160 ff.

4. These relations can be studied in two ways: according to a comparison between chords (pipes, etc.) of different lengths, or according to a comparison between lengths or divisions of the same chord, as the ancients did with the monochord with a movable bridge.[169]

The monochord is analogous to a straight line that when divided produces the musical intervals. In a similar way, the description of the composition of the World-Soul can be understood as the division of a line or band. We will study now how this division produces the ratios of the musical scale.

It is important to notice that the ratios according to the length of the strings (or the pipes, etc.) are inversely proportional to the frequency of vibrations of the string. If an open string gives the sound 1, half (1/2) of the string will give sound 2 (an octave higher than 1); a third of the string (1/3) will give a sound 3 (an octave + fifth higher than 1); a fourth of the (1/4) of the string will give a sound 4 (a double octave higher than 1). The first natural "harmonics" —which are sounds that the string gives when a finger is placed lightly, without pressing, over these proportional lengths — are situated in the divisions of the string according to these numbers. Musical proportions can be considered in relation to divisions of the same string or in relation to the length of other strings. The ratios can be considered taking into account the length of the vibrating source or in proportion to the frequency of waves of sound.

The relation between sound 1 and 2 is an octave, which can be expressed as 1/2 according to the length or 2/1 according to the frequency, because the vibrations of the higher sound 2 are two times (the double) faster than 1. The same happens with 3 and 4: in accordance with the vibrations, sounds 3 and 4 are three and four times faster than 1 respectively. Between sounds 3 and 2 there is an interval of fifth (3/2) and between 4 and 3 (4/3) there is an interval of fourth, according to the frequency (these will be 2/3 and 3/4 according to the length).[170] The proportions contained in the numbers 1-2-3-4 of the *tetraktys* express then, the natural and main intervals of the musical scale. The proportion or series according to the length is inversely proportional to the series according to the frequency.

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[169] Cf. Aristides Quintilianus, *De Musica*, III, 2 (97).

[170] 3/1 (1/3 length) and 4/1 (1/4 length) then are the ratios that express an octave + fifth and the double octave.

In order to explain the relation between intervals it is necessary to take into account that the sum of two or more intervals can be determined by multiplying the corresponding ratios or fractions; while the subtraction of intervals is done by dividing the ratios. The sum of a fifth and a fourth is done through the multiplication of the corresponding ratios (3/2 x 4/3 = 2/1); on the other hand, the subtraction of intervals corresponds to a division of the ratios: e.g. the difference between a fifth and a fourth is 9/8 = 3/2 ÷ 4/3.

The intervals of fifth and fourth are found by subtracting the fourth and the fifth in turn from the octave. 2:1/4:3 = 3:2, 2:1/3:2 = 4:3. Another way of expressing these relations is to consider the interval of fifth as the result of the subtraction between the octave + fifth and the octave: 3/1 ÷ 2/1 = 3/2. The interval of fourth can be understood as the result of the subtraction between the double octave and the octave + fifth: 4/1 ÷ 3/1 = 4/3. The relation between 4 and 2 is the same as that between 2 and 1: an octave (4/2 = 2/1).

Concerning the pitch of sounds, in our example in accordance with frequency 1 is the lower sound and the harmonic sound 2 is an octave higher, 3 is the ascending fifth of 2 and 4 is the ascending fourth of 3. On the other hand, Plato in the *Timaeus* seems to be talking in terms of lengths that are multiplied (in double and triple series) and not in terms of division. Although he mentions the divisions of the mix of the soul, the proportions in which the Demiurge divides that mix are in increasing ratios. In *Timaeus* 35b – c, the Demiurge divides the mix in strips of different length, where the portion 2 is the double of 1. Therefore, if we think of a string with the whole giving a sound 1 and a second string 2 that is the double in length, in this case, the highest note is the sound 1 and the sound 2 is an octave lower (which is half as fast in terms of the frequency of vibrations). When we think of the proportions of the portions of the mix of the World-Soul as stated in Plato's depiction, the relations of the numbers can be imagined as being the proportions of an instrument with strings of different lengths, like a harp or a piano, or in another way, like a single string divided proportionally according to the mathematical ratios (soul = line = monochord).[171]

What is important for our approach is that in a metaphysical doctrine like Platonism in which the different levels of reality are ordered in a hierarchy of

[171] The last example was preferred by Xenocrates and other commentators that represented the soul with the number 2 and the geometrical line in contrast to the *Nous* = 1 and the point at the centre of a circle. Cf. Proclus, *In Timaeum* II. 245.25 ff.

grades in a vertical line, highness or lowness in music can express the relation between levels and how the lower sounds are a repetition or mirroring of higher sounds, because the scale is imagined as developed along a line. The musical scale of the *Timaeus*, therefore, is descendant in consonance with this way of reasoning and also because Plato is thinking of lengths of a string rather than of pitches.[172]

We are aware that the Greeks very rarely represented musical pitch in terms of "up" and "down"; furthermore if they used these concepts of musical space, they usually considered that the "lowest" note (in our terms) of the standard octave was *hypatê* ("highest"), and the "highest" (as we would conceive it) was *nêtê* or *neatê* ("lowest").[173] At the same time theorists usually assigned larger numbers to the higher notes. Nevertheless, from a Neoplatonic perspective, it is not the same to represent the *Timaeus* scale in an ascendant way (from 1 to 27), because otherwise the whole symbolism of the derivation/procession of sound from the One is lost.[174] We have the testimony of Adrastus in Theon of Smyrna (*De util. math.* 65.10 ff.) that explicitly says that

> it is appropriate to assign the greater numbers to the lower notes. (transl. Barker)[175]

If we consider the idea of a triangular psalterium (as the one mentioned by the Aristotelian Problemata (XIX, 23) or a triangular harp (like the cycladic statuette of a seated harp player)[176], it is clear that for a Neoplatonist, term number 1 (or string 1 = corresponding to the simplicity of the unity) is better placed close to the vertex, and the following terms (which follow a multiple proportion, double and triple) are better suited for a progression or derivation to more complex and multiple numbers (larger strings = representing the multiplicity of the sensible

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[172] See [Arist.] *Problemata* XIX, 23: "in triangular psalteria [...] the concord of an ocatave is produced when the length of one string is double, that of the other half." (Barker, [1989] p.93).

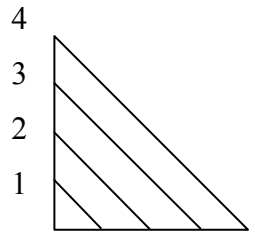
[173] However, in planetary musical scales, most authors linked higher notes with heavenly bodies further from the earth, with the exception of Nicomachus. See Barker (1989), p. 251 note 20. Cf. note 309 in p. 138 below.

[174] Cornford (1937), p. 69, note 1, says: "Nor does it matter that strictly, the notes should be written in descending order." It is true that for a clear explanation intended for the modern reader it is not necessary to do so, but for understanding the symbolic value of the scale in Neoplatonism, where everything comes from the One on top of the hierarchy, it is better to show the scale in a descending way.

[175] Barker (1989), p. 221.

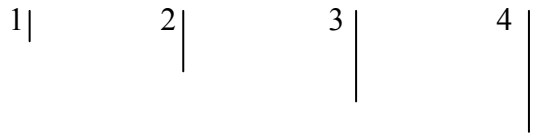
[176] Statuettes from Keros preserved at the Metropolitan Museum of Art, New York (47.100.1) ca. 2800-2700 B.C. and at the National Archeological Museum of Athens (ca.2500-2200 B.C.). It is interesting that on the top of the harp there is an ornament carved in the shape of the head of a swan or other waterfowl. A symbolic connection can be found between the harp, the triangle and the swan, which is what one founds in the constellations that belong to the "summer triangle" in the Northern sky, these constellations are "Cygnus", "Lyra" and "Aquila".

world). The first four terms can be represented by a triangular harp with four strings:



Another characteristic or quality of sound, treated in a symbolic way in the Platonic tradition, would be in agreement with the consideration of the scale as descendant: the last number of the series, i.e. 27, is the lowest note and it is a cube (3^3) that represents the element earth according to Plato. 27 is a solid number and represents heaviness, which is another meaning of "*barys*" (which means both "heavy" and "low-pitched" in Greek). In our interpretation of the scale of the music of the spheres, that we shall study later, the note that corresponds to Earth (*Gea*) and in medieval treatises to the Muse Thalia (as *Thaleia* from *thaleo* "blooming", related to flowers and the sense of smell, etc.) corresponds to the note G which can be assigned to 27.[177]

The relation between the first four numbers of the *Timaeus*' progression (and *tetraktys*) can be expressed in the following diagram (thinking of harp strings, with the shortest as highest notes):



The 2 string gives the octave of 1, the 3 string gives the fifth of 2 and the 4 string gives the fourth of 3: 2/1; 3/2 and 4/3.

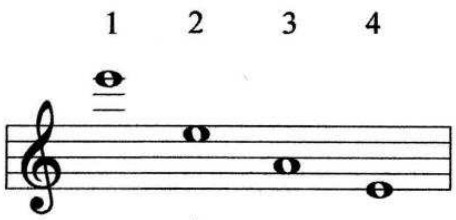
Sound descends in this way in its manifestation from the highest as the original, like the light that descends from its source on top: the highest and transcendent

[177] The compass of the *Timaeus* scale is 4 octaves plus a fifth and one a tone. If we take it in descending order, the last note (27), will be a G if the initial note is consider an E, as we propose to do in order to explain Proclus' interpretation. We prefer to understand the last half part of the scale as a cosmic-planetary scale corresponding to the A-A scheme already used above (pp.65 and 69) and the first half according to the E-E scheme; the last note, the additional tone corresponds to a note G.

Sun.[178] We are more familiar with an example of the expression in music of the manifestation of light that was interpreted as a depiction of the creation of the World, which is the beginning of the *Ninth Symphony* of Beethoven (in D minor), with the descending *fourths* A-E and *fifths* E-A in the string instruments and the French horns.[179] We are going to see that in the scale of the Harmony of the Spheres, the note that corresponds to the Heaven that envelops everything (the whole) is the highest note, which is in agreement with starting the scale on the highest note and considering it descendant and also with Cicero's depiction of the Harmony of the Spheres in his *Somnium Scipionis*.[180]

We can write the notes of the previous diagram of the string in musical notation, with the first numbers of the *Timaeus*: see Figure 1.

Figure 1



The following numbers in the progression are 8 and 9, and we are then in the passage from the first *Tetraktys* to the second one (the one that adds up to 36).

[178] In this system of correspondences light is related to "lightness" and the sensible solids and matter to heaviness and the absence of light and form (*idea* or *eidos* are related to the root of "to see", although we have to admit that we did not find a testimony to prove that Plato or the Neoplatonists consciously thought of this etymology and connections). At the same time Apollo who is the cosmic poet, sings and puts everything in order as the god of light, form and measure.
[179] The first notes of the scale of the *Timaeus* are the same first notes of the *Ninth* of Beethoven.
[180] Aristotle, *Metaph.* XIV, 1093b, presents a different symbolism: the interval between α and ω is equal to the interval between the lowest note of an *aulos* to the highest, which corresponds to the whole system of the heaven (*oulomeleia tou ouranou*). The last letter of the alphabet and number 24 is equal to the highest note (and the "*oulomeleia*"), while the first letter and number 1 corresponds to the lowest. The Renaissance author Robert Fludd, *Anatom.Amphit.Effig.Trip.* (1621), p. 314-15, in a representation of the divine monochord, identifies the first number (384) of the scale of the *Timaeus* according to Proclus' scheme with the letter α and the last one (10368) with ω.

2) *Second Tetraktys. The octave and its composition*

This passage from 1-2-3-4 to 6-8-9-12 is done when we try to find the ratios that correspond to the tone. The interval of tone results from the difference (division) between a fifth and a fourth: 3/2 ÷ 4/3 = 9/8.

The octave can be thought of as well as the sum of one fifth (pentachord) and one fourth (tetrachord): 3/2 x 4/3 = 12/6 = 2/1. If we take into account that the constituent unit of the Greek musical system is the tetrachord (a group of four strings or notes) then the octave can be considered as composed by two fourths and the tone existing between them: 4/3 x 4/3 x 9/8 = 144/72 = 2/1.

The numbers that make the second *Tetraktys* (6-8-9-12) were especially used to explain the octave and both tetrachords united by the tone in the ratio of 9/8, because 12 and 6 are in the relation 2/1. In this way the intervals of the octave can be studied in the octave formed by the numbers 12 and 6 and their proportional means that form the basis of the relation of "octave", without the need of using more complicated fractions.

Plato depicts the mathematical proportional means between the numbers that represent the extremes of the octave in *Timaeus* 35c – 36b:

> Next, he went on to fill up both the double [i.e. between 1, 2, 4, 8] and the triple [i.e. between 1, 3, 9, 27] intervals, cutting off yet more parts from the original mixture and placing them between the terms, so that within each interval there were two means, the one (harmonic) exceeding the one extreme and being exceeded by the other by the same fraction of the extremes, the other (arithmetic) exceeding the one extreme by the same number whereby it was exceeded by the other.
> These links gave rise to intervals of 3/2 and 4/3 and 9/8 within the original intervals. And he went on to fill up all the intervals of 4/3 (i.e. fourths) with the interval of 9/8, leaving over in each a fraction. This remaining interval of the fraction had its terms in the numerical proportion of 256 to 243 (semitone).
> By this time the mixture from which he was cutting off these portions was all used up. (transl. Cornford)

The Demiurge filled up with two mathematical means the double and triple progressions (see p. 79 below). These progressions are in geometrical proportion (that involves a relationship like A is to B as B is to C),[181] which represents as we have seen in Proclus and Iamblichus, the continuity of the "life" of the World, because life is the source of continuous unification of levels (*synecheia*,

[181] The link between the numbers is an "analogy" because it is a relationship between two proportions or relationships: as in the case of the numbers 2; 4 and 8. According to this proportion, 2 is to 4 in the same relationship that 4 is to 8, which is the relationship of "double". Cf. Cornford (1937), p. 45.

sympatheia) and geometric proportion is continuous, binding all the dimensions and producing "space" from the Intelligible. We already saw that the *tetraktys* was considered the source of the eternal life of nature in Pythagoreanism and Platonism developed the notion of geometrical derivation and the consideration of extension as the container of everything. For in its analogical context extension and space can be an image of the Intelligible which is the spiritual container of the sensible, both related to life in its different manifestations (intelligible life and physical life). The arithmetic and harmonic means continue binding the intervals manifested with the geometrical means so as to assist this universal life in having rhythm and an order, and produce a more unified and harmonious whole in which symmetry and analogy (in the sense of proportion) are the main operative principles of order.[182] The musical octave (as in 6-8-9-12) is a perfect example of symmetry. In the *Timaeus* progression, we had the double intervals (1-2-4-8) that are *octaves*, and the triple intervals (1-3-9-27) that are between them octaves + fifth and in relation to the double, fifth, fourth, tone, etc.

In this context, the world is the product of the combination of the sciences of the *quadrivium* (arithmetic, harmonics, geometry and astronomy). For these sciences before being human disciplines are demiurgic and cosmic ways of ordering being and reality. Our sciences, on the other hand, follow the ontological order of the universe. Music and astronomy — since the planets will follow the same scale of the World-Soul — are then an audible and visible manifestation of a Cosmic harmony of numbers which is previous and not manifested.

Plato now includes two "means" that join and fill up the intervals opened (produced) with the geometric progression: the harmonic mean and the arithmetic mean. According to the passage quoted above (36 a-b) the *harmonic* mean exceeds one of its extremes and is exceeded by the other, by the same fraction: i.e. between 6 and 12 the harmonic mean is 8 because 8 exceeds 6 by 2, and 2 is 1/3 of 6, at the same time 8 is exceeded by 12, by 4, which is 1/3 of 12. The *arithmetic* mean exceeds and is exceeded by the same quantity: i.e. between 6 and 12 the arithmetic mean is 9 because it exceeds 6 by 3 and is exceeded by 12 by 3.[183]

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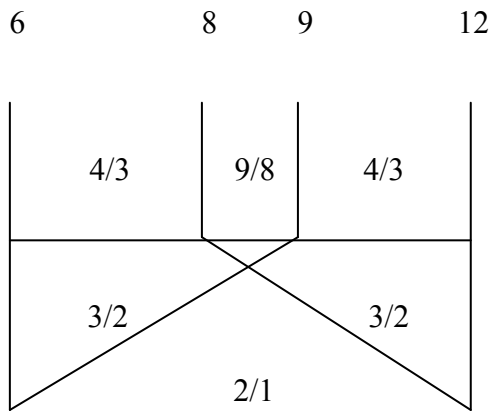
[182] Cf. *Timaeus* 31d – 32 a ff. about the proportion and bond between the four elements.

[183] Cf. Cornford (1937), p.71 note 1. Cf. Burkert (1972), p.385 about the importance of the arithmetic and harmonic means in Archytas (cf. DK 18.15, Philolaus A24, etc.). Burkert explains that according to the Pythagorean foundation of the intervals in superparticular proportions

The numbers 9 and 8 (arithmetic and harmonic means), are at the same time the ratio of the tone (9/8) as we have seen before. Between 9 and 6 there is a relation of fifth (3/2) and the same happens symmetrically with 12 and 8 (3/2 = fifth). Between 8 and 6 there is a relation of fourth (4/3), with the symmetrical correspondent interval of fourth between 12 and 9 (4/3). As we said there is a tone between 9 and 8 (the difference between a fifth and fourth) and an octave between 12 and 6 (2/1).

The following diagram (from the codex of Iamblichus' *Vita Pythagorica* 26, 117) shows the mathematical foundation of the octave and its symmetry; being composed by two *tetrachords* separated by a tone, or from another point of view, composed by a fifth and a fourth:



This diagram shows the interplay between the harmonic and the arithmetic means in producing the fourth, the fifth and the octave. This structure recurs in the whole extension of the scale as the passage of the *Timaeus* in question states (*Timaeum* 35c – 36b). We have shown above the double and triple progressions and their means; it is important to come back again to the already presented

(epimoric ratios of whole numbers like 2/1, 3/2, 4/3 and 9/8), and since this kind of proportion is indivisible (Archytas A19), "the octave, the fifth, the fourth and whole tone cannot be divided into equal parts, so that the arithmetic and harmonic mean take the place of the geometric in music theory." Burkert prefers to consider the series 6-8-9-12 that arises from the arithmetic and harmonic means as an ascending one e a b e´ as indicated by Arist. fr. 47. He also quotes Iamblichus, *In Nic.* 118.19 ff where 6-8-9-12 is called the *teleiotate harmonia* brought by Pythagoras from Babylon. Burkert considers that the treatment of means in musical theory in the *Timaeus* (and *Epinomis* 990 e) comes from Archytas.

diagram and complement it in a new diagram[184] with the combination of both series in a single series:

1	4/3	3/2	**2**	8/3	3	**4**	16/3	6	**8**
	HM	AM		HM	AM		HM	AM	
1	3/2	2	**3**	9/2	6	**9**	27/2	18	**27**

Both combined:

	HM	AM		HM	AM			HM	AM					
1	4/3	3/2	**2**	8/3	**3**	**4**	9/2	16/3	6	**8**	**9**	27/2	18	**27**
		HM	AM				HM		AM			HM	AM	

The new diagram shows the unity of the series; while some of the commentators of the *Timaeus* preferred the *lambda* scheme (Crantor, or Adrastus, a triangular diagram), others were inclined to see the scale as a straight line ("as in the section of a rule", *In Timaeum* II.171.5). Proclus says in this passage that the latter were Porphyry and Severus, who rejected the *lambda* and arranged the numbers sequentially, as in the divisions of the monochord (canon = rule or monochord). Proclus says that he will follow this way of representing the scale.

The *lambda* stresses the fact that there are two progressions, the double and the triple; the straight line on the other hand emphasises the continuity of the procession (combining double and triple in a single series), showing the presence of procession and conversion acting at the same time (represented with the double and the triple) in the Universe:

> For he did not say to separate the double series and the triple series, but rather he mixes the two series up, going from doubles to triples and proceeding in a straight line. (*In Timaeum* II.175.18-21)

As Proclus points out (II.171.10 ff.), the study of the scale comprises three stages:

[184] Cf. Cornford (1937), p. 71 and Haar (1960), p. 8.

> [Plato] divided the whole topic of the soul's harmony into three sections. First, there is the arranging of the seven portions into double and triple intervals that form a geometric progression. Second is the insertion of the other means – the arithmetic and harmonic means – into each interval in the double and triple series. Third is dividing of the epitritos [4:3 ratios] and hêmiolios [3:2 ratios] into the epogdoos [9:8 ratios] and the semi-tones. The account of the parts of the soul has been limited to just these matters.

Most ancient and modern commentators agree that there are no great difficulties with the first two sections of the study of the scale of the soul. The problem of how to interpret the scale arises when trying to fill the 4/3 and 3/2 intervals with tones of 9/8 and semi-tones of 256/243. The work known as "Timaeus Locrus, *De natura mundi et animae*", presents a possible solution and Proclus will present a different one (although in the preserved text of Proclus there are discrepancies that make his scale similar to that of Timaeus Locrus in some respects, as we shall see). The safer way of filling the tetrachords is by considering them Dorian tetrachords in a descending order with the structure 9/8 + 9/8 + 256/243 (tone-tone-*leimma*).[185]

Plato explains the composition of the *tetrachord* when he depicts how the Demiurge

> went on to fill up the intervals of 4/3 (i.e. fourths) with the interval 9/8 (the tone), leaving over in each a fraction (*leiphtheises*). This remaining interval of the fraction had its terms in the numerical proportion of 256 to 243 (*Timaeus*, 36b 1-5, transl. Cornford).

The interval of fourth is then constituted according to Plato from two equal tones and a left over (*leimma* in Pythagorean terminology which is a word related to *leiphtheises* used by Plato). This is the semitone known as "*leimma*" (called *diesis* by Philolaus), which is the "lesser semitone".[186] There is still another semitone called "apotome" (the "greater semitone"), which is the difference between the tone (9/8) and the *leimma* (256/243) = 2187/2048. We shall deal with this interval in the following chapter. In mathematical harmonics there can be no exact half-tone because the Pythagorean way of analysing intervals as ratios of numbers does not admit this kind of exact division.[187]

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[185] Cf. Haar (1960), p. 21.
[186] Cf. Huffman (1993), p.153. Cf. also notes 285 and 291 below.
[187] Strictly speaking a *leimma*, which corresponds to the Platonic/Pythagorean terminology, is not a semitone; "semitone" on the other hand, is an expression that belongs to the Aristoxenian theory of the division of the tone. In Pythagorean music theory there is no such thing as a "semitone" (or half tone); the *leimma* is the result of subtracting two tones (2 x 9/8) from the fourth (4/3). See Barker (1989), p. 38, note 36, who quotes Philolaus, Boethius, etc. and p. 216, note 26 on Aristoxenus.

According to the Pythagorean/Platonic diatonic genus, in the interval of fourth (or *tetrachord*) there is room for two whole tones and a "left over" that is not enough to make another tone, which is a fraction in the ratio 256/243, the semitone. So, if we add two tones and a semitone (multiplying the ratios), we have:

4/3 = 9/8 x 9/8 x 256/243.

The fifth in turn, contains three tones and a semitone:

3/2 = 9/8 x 9/8 x 9/8 x 256/243.

The Demiurge in the *Timaeus* has filled up the double and triple intervals with the arithmetic and harmonic means, which produce intervals of fifth and fourth that in turn include tones and semitones (*leimmata*). The difficulty in working out the scale consists in which place (or order) we should include the tones and *leimmata*, and how to combine the fifths and the fourths according to the harmonic and arithmetic means. This is mainly because if one fills the notes in the double progression, there are points in which the triple progression does not match in the same way. This will be clear when we study Proclus' working out of the scale, according to the method inherited from the Academy, which calculates the intervals having as number base 384. This number was used by Crantor (Plutarch, *De An. Procr*. 1020 ff.) and Theon of Smyrna (*Exp*. p.153) and it is "the lowest number on which Plato's entire series can be built in integers".[188] This will be covered in more detail when we study Proclus' version of the scale.

3) *Third Tetraktys. The double Tetraktys of the Timaeus*

We have studied the first *Tetraktys* 1; 2; 3; 4 and also the mathematical proportions of the octave represented by the numbers 6; 8; 9; 12, which form the second *Tetraktys* according to Calcidius. Then we shall continue with the whole Scale of the *Timaeus* that arises from the intervals that we have been studying up to this point. We include then the intervals studied in the *tetraktyes* 1;2;3;4 and 6; 8; 9; 12 in a totality of a more extended Scale composed from all the numbers of the third *Tetraktys*, the Platonic one, which is the double series of four numbers: 1; 2; 4; 8 and 1; 3; 9; 27.

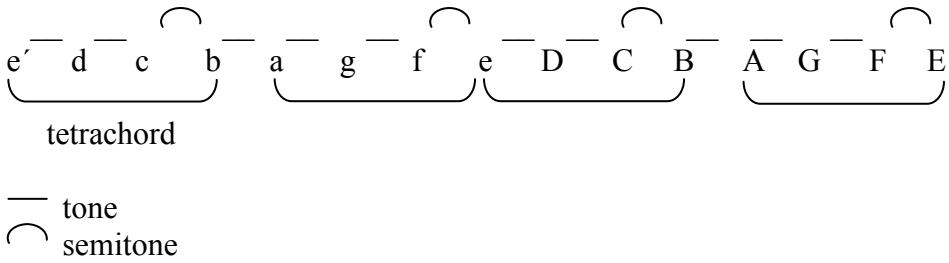
[188] Haar (1960), p. 10. Adrastus probably used these numbers (he used three successively larger triangles with different numbers, the primary series, the insertion of the means and the completed series, Proclus, *In Timaeum* II. 171.4). Cf. Haar, *ibid*. p. 21. Severus preferred 768 as number base and he finished his scale with a *leimma*, (*In Timaeum* II.191.1 ff.).

The musical scale of the *Timaeus* contains the different numbers as a totality composed of *tetrachords*. Although the interval of fifth is very important in the generation of the Pythagorean scale and as a determining principle in the musical space (or extension) opened by the octaves, the *tetrachord*, which is the interval of fourth, is the constituent unit of the musical discourse (and not the tone). The tetrachord is then the basic structure of the scale and in the same way that syllables composed of *stoicheia* or "elements" (letters with elementary meaning) are the structural units of language (units of meaning, stems, and not isolated letters).[189] We know that this word "*stoicheion*" has a cosmic sense in the Presocratics. Plato also applied the letters and syllables analogy to the elements (*Timaeus* 48b) comparing the nature of language with the nature of the world. Nicomachus (*Harm*.9, 252.4 Jan) says that Philolaus called the interval of fourth "*syllaba*" (for it is the first grasp [*syllêpsis*] of concordant notes) (Philolaus fr. 6 transl. Huffman).[190] Although in this musical context "*syllaba*" just means "grasp", indicating the position of the left hand of the lyre-player on the strings, we could speculate on the different associations that this word could have set off in a Presocratic like Philolaus, who could have compared the structure of speech and music with the cosmos, combining the musical and cosmological fields, in a similar way than Plato. There is no evidence of this association of meanings in the preserved testimonies of Philolaus but his notion of cosmic harmony could allow such a connection.

Therefore, in this musical/cosmological context, it is not surprising to find that the structure of the World-Soul's harmony is based on the *tetrachords*. The composition of the scale as a group of descendant *tetrachords* or fourths can be represented in this way:

[189] In the etymological analysis of language done by Plato in the *Cratylus*, the units of meaning are syllabic and not separated letters, or at least groups of consonants.

[190] See Huffman (1993), p.145 ff.. Cf. also p. 151 and pp. 162-163 on the origin and meaning of the word "syllaba". It is difficult to establish which meaning of the word was the original and which the derivative, the musical or that concerning language. It is possible that grammarians compared letters with musical notes or that theoreticians of music compared musical notes with letters. But since Philolaus' testimony is considered authentic it is possible that "syllable" was a musical term in the beginning. Cf. Barker (1989), p. 37 and (2007), p. 265.

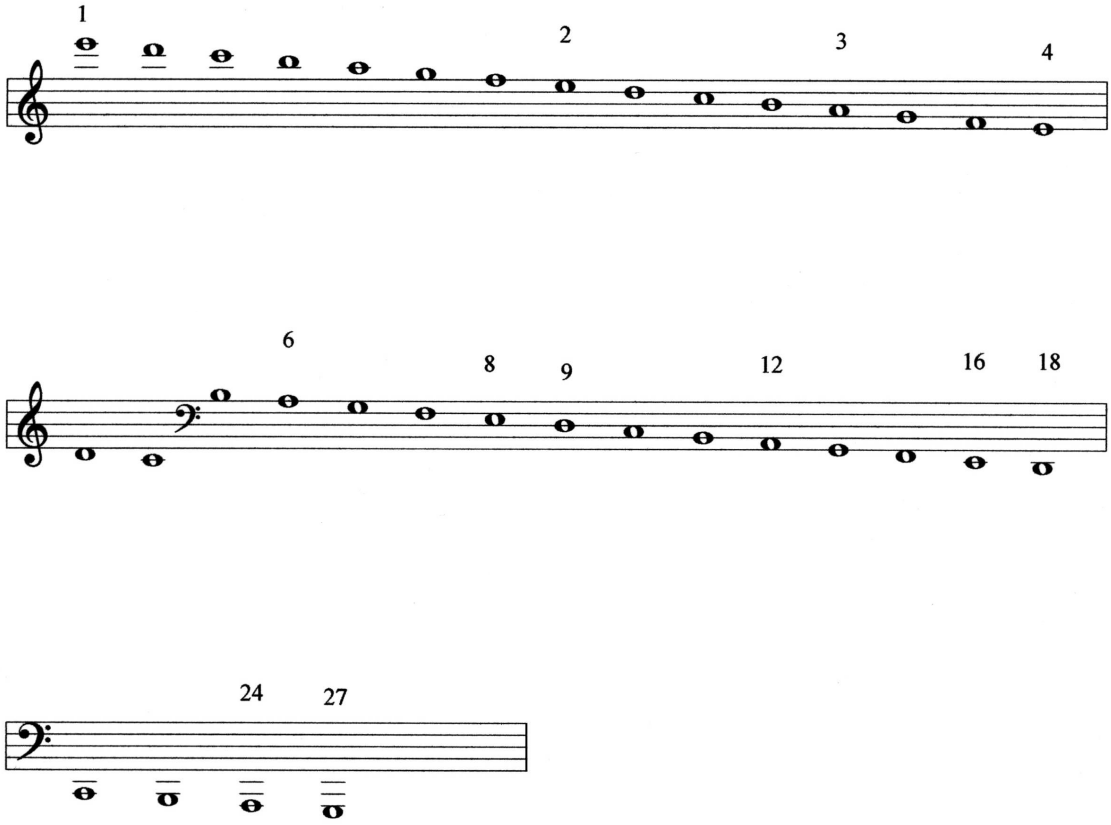


The *leimma* or semitone is the last part of each tetrachord depicted in the *Timaeus* 36 a-b as a "left over" (represented with an arc); this together with two tones composes the tetrachord which is a group of four notes. A fifth is composed of three tones and a *leimma*. Then, after the fourth we have the fifth, which is also very important for the basic structure of the scale because the two means (the harmonic and the arithmetic), mark in the indefinite space of the scale the main points that correspond to fourths and fifths (as we have seen in the diagram on p. 79 of the two progressions, the double and the triple).

We have taken into consideration up to now the numbers 1; 2; 3; 4; 6; 8; 9;12 (belonging to the two previous *Tetraktyes*) and the musical correspondences between numbers and notes; but we know that Plato continues the progression until 27, which in turn will correspond to a musical note that will be the last one in the extension of the Scale.

According to the Platonic double *Tetraktys*, the musical Scale of the World-Soul stretches out from an *e* = 1 (*mi* as the highest note) towards a G = 27 (*sol* as the lowest note) and it is a descendant scale. See Figure 2.

Figure 2



As is shown in Figure 2, the musical scale of the *Timaeus* contains: two octaves of the first *Tetraktys*: 1; 2; 3; 4; one octave of the second *Tetraktys*: 6; 8; 9; 12; and finally, these numbers are doubled in the next octave: 12; 16; 18; 24, which ends with an additional tone that corresponds to number 27. Between 24 and 27 there is a tone (27/24 = 9/8). All these numbers are contained in a way in Plato's progression, which constitutes the third *Tetraktys* mentioned by Calcidius. However, some of these numbers are mentioned explicitly in the *Timaeus* series, while others (6; 12; 16; 18; 24) arise according to musical proportion. Thus, the World-Soul encompasses in its musical essence the manifestation of sound that descends from the first term —which is an image of the First Principle, projected in the Monad of the Soul—, towards the solid body, over which the Soul has to preside, represented by the last term: 27, the cube of 3.

The scale presented here is consistent with the Neoplatonists' aim of regularising its structure; in this way, the inclusion of the second *tetraktys* (6-8-9-12) helps us achieve a coherent interpretation of the scale. On the other hand it is not possible to confirm that Plato would have intended the solution presented here or if Proclus' more detailed account presented in the following chapter corresponds to Plato's own scheme. One difficulty in Plato's own account is that he depicts how to "fill up" the open fourths left between pairs of numbers, but not what to do with the open fifths which appear between some of the larger numbers (in the terms used on p. 79, the fifths appear between 9 and 27/2, and between 18 and 27). One solution to this problem is to understand that Plato meant in *Timaeus* 36b not to "fill up" the "fourths" alone, but all the intervals between 1 and 27 as Dorian "tetrachords" composed of two tones and one *leimma*, as Cornford says (p.72). However, some difficulties arise when filling up all the intervals, as we shall see according to Proclus's scheme.

Chapter 2. The scale of the *Timaeus* according to Proclus. The musical scale as a mirror of the Intelligible.

Musical mirroring

We have studied how the musical scale of the *Timaeus* is composed according to the traditional Pythagorean *Tetraktys* and several variations of this numerical structure (other quaternaries or groups of four). The *Timaeus* scale comprises, as Proclus says in his *In Timaeum* II. 170.2:

four octaves + one fifth + one tone, because the addition of intervals is determined by multiplying their corresponding ratios:

$$16 \times 3/2 \times 9/8 = 27.$$

The last term, i.e. 27, contains the whole scale as the result of the addition of the numbers that correspond to the preceding intervals (1+2+3+4+8+9 = 27). In this way the scale extends to the cubic number as a limit for symbolic reasons.[191] Proclus' understanding of the scale follows a metaphysical and cosmological interpretation of the scale, according to which there has to be an explanation for its extension. If the scale manifests the cosmic order —and furthermore, the harmony of the World-Soul and its principles—, all the levels of reality must be contained in its range.

The *Timaeus* scale is primarily the scale of the Soul. Nevertheless, since the Soul is the nearest cause of harmony for the world (cf. *In Timaeum*, II. 207, 28-32), at the same time — because of mirroring a previous Ideal harmony (endowed by its Creator, the Demiurge) — it contains a reflection of the previous causes. In addition because of being cause of order for the World's body, it contains the sensible world as well.

The Platonic tradition of music in the Middle Ages refers to this mirroring of different levels of harmony with the expression "*musica speculativa*". It was not only used to indicate an intellectual reflection on music, it also denoted the essential ability of music to mirror (*speculare*) an intelligible Harmony. If the theoretician applies his intellect in the study of music, he would be able to see this mirroring, and his intellect would mirror in turn that harmony, being adapted to it

[191] On the extension to "cubic numbers" compare Adrastus (Theon Smyrn. 63.25 ff).

and producing a kinship between the thought and the object of thought that was meant by the word *speculatio*.[192]

The purpose of this chapter then, is to explain how according to Proclus all the levels of the Neoplatonic universe are mirrored in the *Timaeus* scale. In order to speak accurately, the Soul (and its harmonic structure) mirrors the Intelligible. On the other hand, and strictly speaking, the Soul does not mirror the derived level of the cosmic order. In the case of sensible harmony (including the Harmony of the Spheres), it is more appropriate to say that the Soul contains the paradigm of the sensible cosmos (Proclus, *In Timaeum* II. 236.5). Proclus clearly states that the Soul is all things; the Intelligible, *eikonikôs* (after the manner of an image), and the sensible, *paradigmatikôs* (after the manner of an exemplar).[193] The Soul contains everything in its median manner; "the soul is 'iconically' all that the *Nous* is 'paridgmatically'", as Merlan points out.[194] The same can be said about the relation between the sensible world and the Soul, the world is present 'paradigmatically' in the Soul, and the harmony of the world is 'iconically' the harmony of the Soul.

As Joscelyn Godwin has stated, to see the cosmos in the mirror of music can help our thought to understand and illuminate it better.[195] If we apply this to the philosophy of Proclus, where illumination always comes from the Intelligible world (even if it is through the agency of Soul), we can understand that to see the cosmic order reflected in a musical scale is in reality to contemplate the illumination of a *noetic* harmony in musical sounds.

Theoria (contemplation) is both illumination and an expression of *noesis*; it is an operation of the universal *Nous* in our soul that illuminates the object of knowledge (in a musical sense this can be compared to an inner voice), and therefore, the theoretician of speculative music is able to perform an intellective activity that has its origin in the same Intellect that created that harmony in the first place in the World-Soul, which is the divine Intellect or Demiurge.

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[192] Many medieval treatises on music were called "*Musica Speculativa*" (Ioannis de Muris or Jacob de Liège, etc.; cf. Desmond [2000]), in the sense that in this process of contemplation (*speculatio* or *theoria*) music receives the principles of harmony, that were explained in the treatises. This approach to music comes from Theon of Smyrna and Boethius' *De Musica* and his sources in Nicomachus, etc. (cf. note 473 below). See Godwin (1982), for a meaningful study on speculative music.
[193] Cf. Proclus' Prop. 195, *Elements of Theology*, already quoted on p.13.
[194] Merlan (1968), p.21.
[195] Godwin (1982), p.373.

As we have seen, everything is contained in the Scale of the Soul because it has been composed by the Demiurge as a mirroring reality: an image of the Intelligible (its model); and at the same time the Soul itself is the model of the Harmony of the Spheres. In its intermediary nature we can say the the Soul contains in the musical picture of itself its own mediating nature, as a reflection of itself.[196] The scale of the *Timaeus* is accordingly a cosmic symbol of the whole reality reflecting three levels: 1) the Demiurge (the Intellective aspect of *Nous*) and the Intelligible model as well; 2) the Soul and its harmony, which is the paradigm of the last level 3) the harmony of the world.

In this sense, the secondary levels mirror the Intelligible or higher causes. Nevertheless, we can find a different point of view, in Platonism, in which the mirror can be considered as the highest level while the image reflected in it belongs to the derived and manifested reality. We think, for example, of the famous comparison of the mirror with the eye in Plato's *Alcibiades* I (132d - 133c). In this case, Plato says that the soul in order to know itself needs to look at the mirror of God. However both aspects of the mirror are related: on the one hand the mirror reflects God's Perfection — in Neoplatonic terms the *Nous* is the mirror of the One — and this corresponds to the *Nous*' eternal life. On the other hand the Soul contemplates the *Nous* and in this way time is a mobile image of Eternity; and that is the self-moving life of the Soul turning around the *Nous*. The poet Rumi depicting how he keeps seeing the image of his master Shams, compared to a moon, says:

> If Plato had seen the beauty and loveliness of that moon, he would have become madder than I and more distraught.
> Eternity is the mirror of temporality and temporality of Eternity: In that mirror, these two are intertwined like his two tresses.[197]

Another text, this time by Saint Clare of Assisi, shows how the mirror can represent divine mediation and expresses the way in which the soul needs to transform itself into an image reflected in that mirror through contemplation: which is also the aim of *Musica Speculativa*, through which the soul transforms itself into a sonorous image of the divine Harmony:

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[196] Cf. Proclus, *In Timaeum* II.207.20 ff.

[197] Transl. by Chittick (1983), p.141. When Eternity is compared to a mirror or the moon, we could think in Neoplatonic terms that the comparison refers to the *Nous* as mirror of the One (which is the Sun and source of light). Through the intermediary of the *Nous* the Soul (temporality), when it in turn becomes a mirror, achieves in this reflection and through the mediation of the *Nous*, its unity and harmony.

(12) pone mentem tuam in speculo aeternitatis, pone animam tuam in splendore gloriae,
(13) pone cor tuum in figura divinae substantiae et transforma te ipsam totam per contemplationem in imagine divinitatis ipsius.

Place your mind before the mirror of eternity!
Place your soul in the brilliance of glory!
Place your heart in the figure of the divine substance!
And transform your whole being into the image of the Godhead Itself
through contemplation! (Saint Clare of Assisi, *Third Letter to Blessed Agnes of Prague*, 12 ff.)[198]

Saint Clare of Assisi, mentions after this (nº 16) the beauty of the Sun and the Moon, and she herself was compared by others to the Moon, while Saint Francis was compared to the Sun. The moon is a symbol of the mirror, which in a way is an intermediary mirror between the divine and the soul. In Neoplatonic terms, the Sun is the Good, consequently, the mirror of the Sun (the moon) can be the Intelligible in a sense (in the same sense, the source of the World-Soul is compared to a *Krater* in the *Timaeus* 41d, where the harmonic mix of the World-Soul is composed).[199] The mirror is the macrocosm, and the image, the microcosm. In this sense it can be said that "the macrocosm and the microcosm are like two mirrors facing each other".[200]

Consequently, one can also say that the sensible world mirrors the World-Soul and that it is the World-Soul *eikonikôs*, as we mentioned before. The macrocosm is the inner model and paradigm of the microcosm (both as the model of the city and the model of the individual man); in that sense there is in that level a Universal Man, which is *paradigmatikôs*, the microcosmic man that is related to the idea of pempadic proportion behind Leonardo da Vinci's famous picture.[201]

The Soul encloses everything, mirroring the higher levels (in a passive way) and the lower (in an active way) and this is also shown in a musical way. For it

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[198] Transl. by Armstrong and Brady (1982), p.199.
[199] Proclus (*In Timaeum* II.151.9 ff. and II.163.10 ff.) identifies the *Krater* or mixing bowl with the intelligible life and also with the Life-giving goddess. This goddess is the Hecate of the *Chaldean Orcales*, as Festugière suggest in his translation of *In Timaeum* II.151.9. Proclus distinguishes two levels in the demiurgic creation: according to the first the Demiurge creates the wholeness of the Soul and its intermediate essence (mixing the different genera). According to a second mixture, this time made on the *Krater*, identified with the goddess, the Demiurge divides and harmonizes the Soul according to the musical proportions of the scale.
[200] Chittick (2005), p.49.
[201] Nevertheless, in classical Platonism, this universal man belongs to the universal and divine level, and it is not the individual man taking the place of the divine. In the case of the Renaissance and its anthropocentrism, one cannot be sure about the correct interpretation of the representation. Of course, Plato cannot agree with Protagoras when the latter says that "man is the measure of all things". It is only the divine and Apollo who is measure of all things, and Apollo from one point of view can be considered the universal man. The question is: is Leonardo following Plato or Protagoras? In Islamic thought the notion of Universal Man can be found in Ibn 'Arabī for example, cf. Chittick, *ibid*. p.50 ff.

has in itself all the proportional means and it is the harmonic bond between the Intelligible and the sensible (the Soul is receptive of the intelligible Harmony and it orders the World according to that image, and surrounding it with its light and resonance, it brings it to harmony and unity). Accordingly, the musical scale that represents the Soul's nature expresses the whole vertical line of reality, which is what we want to show in this chapter.

The musical scale and axial symbolism

Another aspect that we need to investigate is why the scale is divided in the way in which Proclus reports, i.e. in a group of octaves plus one fifth and one tone (cf. *In Timaeum* II. 170.2), as we have already mentioned. We have seen in the previous chapter how the musical scale is derived from the harmonic divisions of the string. As we have mentioned above (pp. 43 and 79) Crantor preferred to display the musical progressions in a *lambda* scheme. Other commentators of the *Timaeus* —such as Theodorus and Severus—, on the other hand, preferred to arrange the numbers and the musical intervals they represent in a vertical line, probably thinking in terms of the analogy of the musical string (the monochord) and the vertical relation between levels in the universe.[202] The notion of verticality is related to a very important symbol in this context, which is that of the projection of a luminous ray from a higher source that creates the Universe by means of emanation of light. Plato in *Laws* 645a compares human nature with a puppet (a puppet of the gods) and after comparing the affections in us with cords or strings (sinews) which pull us in different directions, he recommends that we should follow and attach ourselves to the

> golden and sacred cord of reason (*logismos*), called by us the common law of the state. (transl. A.E.Taylor).

This word, *logismos*, usually translated as "reason" or "calculation" in this context is clearly associated with a Pythagorean notion of law and virtue based on sacred arithmetic (which is something very different from "calculation" in the scientific sense of modern materialism). Plato uses the term *logismos* when he enumerates the four mathematical sciences in *Prot*. 318e and also in *Rep*. 510c. In these cases it means clearly "arithmetic".[203] What is the relation, then, between

[202] Cf. Dillon (2003), p. 224.
[203] This term is used by Proclus in the sense of arithmetic in *In Timaeum* I.118.3. It can refer also to the "reasoning" of the Demiurge according to Plato's *Timaeus* 34a8 (Proclus, *In Timaeum* I.230.2; cf. also I.398.16 ff.: translated by Runia as "thought" and II.61.18) and it is one of the

reason, arithmetic and law, and why is this cord "made of gold"? To answer this question we need to investigate the Pythagorean implications of the "golden string" of the *Laws*.

This symbolism expresses the power of unifying oppositions and harmonizing contrary affections in a temperate (well tuned) mix. And this is possible because the cord is a microcosmic manifestation of the universal law identified with the Sun (hence the golden quality of it).[204] Delatte examines a Pythagorean text attributed to Archytas of Tarentum (*On Law and Justice* 43.134 M = IV,1,138, p.86, 18 H), where the author compares the function of law in the city with the function of the Sun in the Universe. The Sun has the power of tempering the seasons (producing *eukrasia*) and creates *eunomia* conceived as universal harmony and rhythm.[205] The author also mentions that Zeus is called *Nomios* and associates this name with the musical meaning of *nomos*, which is a musical composition; such compositions "create order in the soul, because they are sung according to harmony, rhythm and meter". Delatte points out that in a previous fragment of the same work (*On Law and Justice* 43.132 M = IV,1,135, p.82, H)[206] there is a comparison between Law and Harmony and between the city and the soul. The comparison is expressed in the form of a proportional analogy:

$$\frac{\text{Law}}{\text{Soul and Life}} :: \frac{\text{Harmony}}{\text{hearing and voice}}$$

Plato is connecting different metaphors in *Laws* 645a6 ff.: we have an inner law which is a "golden cord". This cord in turn is identified by Plato with reasoning (*logismos*). In the political life of the city this is manifested as "law" (644d3) and citizens should always follow it (i.e. the law identified with the golden cord) (645a6). At the same time *logismos* is connected to "logistic", the

main qualities of the World-Soul, which as a creation of the Demiurge participates in *logismou kai harmonias* (*Timaeus* 36e6-37a1; cf. *In Timaeum* II. 294.18 ff. where Proclus identifies "demiurgic *logismos*" with Hermes and "intelligible *harmonia*" with Apollo). At the level of the soul, it corresponds to *dianoia* and discursive thought, however, illuminated by the *Nous* (Cf. *In Timaeum* I. 283.1), which for Proclus is the starting point of Timaeus' method (the first step of which is compared to inspiration). Timaeus starts from the principles and from them follows his investigation as a process of reasoning similar to the demonstrations of the geometers.

[204] Another traditional symbol connected with this and often mentioned by Proclus, is the "golden chain suspended from the Ether" (*In Timaeum* I.314.15 ff). Cf. Homer *Il*.8.19.

[205] Cf. Delatte (1922), p.117. According to Delatte (p.121) the Pythagorean author identifies law with *logos*.

[206] *Ibid*.p.120. Cf. p.83 ff.

name for the science of number (arithmetic), used by Archytas (Fr. 1 and 4) and Plato, *Rep*. VII 525a-c and 536d.[207]

The equivalences: "golden cord = reason = arithmetic = law" of Plato's *Laws*, can be better understood in the context of Pythagorean associations between Sun, arithmetic, harmony, etc. It is important to keep in mind the image of the puppet and that the cord actually gives verticality and conducts it, not like the iron cords, in a rigid way, but in such a way that it has the life and warmth of the Sun. The golden cord simultaneously expresses the malleability and receptivity of the soul to that kind of life: that can be compared to hearing or accepting the vibration that comes from above through the string.[208] This is for Plato a higher kind of life that connects to the Sun, which is a mediator between the intelligible Harmony and intellectual light (cf. Proclus, *Hymn to the Sun*). This noeric light (*noeron phôs*) has, according to Van den Berg, two functions: a) "it creates order and harmony in the Universe" and b) "it elevates all things to the Demiurgic *Nous*" (= it is anagogic).[209] We are examining point a) in chapters II and III and we shall study point b) in Chapter IV.

The Apollonian light, whose rays are like golden strings, produces cosmic harmony and holds the caused beings in tension (as a string does) towards the source of light and calls back to their origin the souls that had proceeded. This manifestation and return is done gradually through the scale of harmony, represented in the string of the Lyre (which is usually depicted as a golden Lyre) or the Monochord.

The Sunray makes the whole a continuous order because it connects back to the single Principle of everything, which is the source of the illumination (*ellampsis*, cf. e.g. Plotinus, *Enn.* IV.3.17.12). It is important to note that this order is a living order —made of luminous light and not of dark and rigid iron— and that the dynamic symbolism of music and its resonance can express the same idea.

Therefore, the musical scale is an axial symbol, expressed in audible terms, comparable to the Sunray expressed in visible terms. In the Myth of Er in the

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[207] See Huffman (2005), p. 68 ff.

[208] The ray of divine light of the Intellect that creates the manifested universe can be identified with the active principle, which in many cosmogonical myths is reflected on the primordial waters, or passive principle. The concentric vibration of the waters, starting from the centre, represents different levels of illumination.

[209] Cf. Van den Berg (2001), p. 153 and Proclus' texts quoted there.

Republic (616b), Plato mentions an axis of light ("straight as a column" and "resembling the rainbow") that holds together the spheres of the world. In musical terminology the axis is expressed as the harmonious structure of a string that unifies the harmony of the different levels (the Sirens in the myth). Both symbols (sunray and string) recall the Apollonian character of this analogical conception; especially because string instruments such as the Lyre are consecrated to this god. It is well known that the arrow[210] is a symbol of the Heavenly Ray; and both the lyre and the bow function in the same way: one throws arrows, the other sounds or melodies.

Another symbol, the golden arrow of Abaris, plays an important role in the story of Pythagoras (Iamblichus, *V.P.* 91). It is said that Abaris travelled around the world with the golden arrow, riding *on* it (Herodotus 4.13)[211]; a detail that shows that the arrow is not only a projectile —a message or manifestation from Apollo—, but it is also a vehicle to come back to him. The same applies to sound: a song (a hymn, etc.) creates a vehicle for the ascending soul (sometimes musical instruments represent vehicles too).[212] The scale of the *Timaeus* can be understood then as a manifestation of order and as a vehicle for the return of the soul.

The importance of Iamblichus' reference to Abaris returning the arrow to Pythagoras, resides in the fact that this is a way of expressing the orthodoxy of the Pythagorean tradition and Pythagoras' affiliation to the Hyperborean Apollo.[213]

Pythagoras' name is as well related to the Pythia and the place where Apollo killed the serpent Python with his arrows.[214] This place was considered the centre of the World (*omphalos*), a detail that connects this myth with the axis of light mentioned by Plato, which is as well the centre of the universe. This mythical

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[210] Cf. Guénon (1962), Ch. XXVI "*Les armes symboliques*".

[211] Iamblichus and Heraclides Ponticus also refer to the riding of the arrow. Cf. Bridgman (2005), p.118.

[212] See the gold bull-headed lyre of Ur, for example. Although we are not aware of any Greek or Roman instrument designed with the shape of a vehicle, it is relevant to notice that lyres and harps sometimes carry representations of birds, especially Apolline swans (see note 176 above). Apollo's or Venus' chariot pulled by swans can be connected to this symbolism. Cf. Martianus Capella, *De Nupt*. I.27-29, pp. 19-20 Dick, where swans carry the Muses to their place in the planetary scale of the harmony of the spheres.

[213] The fact that the Hyperborean Apollo resides in the North, expresses the polar (axial) character of these symbolisms.

[214] Other heroes that killed a chthonic monster, e.g. a dragon, are related to music and harmony, like Cadmus. There is also a link between the aulos and Perseus' killing of Medusa, related in Pindar *Pythian* 12. Saint George corresponds to the sphere of Mars and the science of Music, in Dante's cosmology of *The Banquet*, Book II, XIII, 1 ff. In Mozart's *Magic Flute* this symbolism reappears when the three ladies, attendants of the Queen of the Night, kill the dragon at the beginning of the opera.

episode was depicted in music in the famous *Pythikos nomos*, in which the aulos represented in music Apollo's defeat of the *Pythian* dragon.[215] To transfix the serpent with the arrow means to fix it on the ground, on the centre of the earth around Apollo's axis, therefore to fix the chthonic reality on heavenly principles and harmonizing its movements or vibrations (in the same way that the revolution of the universe is fixed around an immobile pole). A parallel symbolism can be conceived when tuning the string of the Lyre, attaching it to its peg (*kollops*); thus harmonizing, fixing and defining the intervals that the string is able to produce.[216]

The mythical background of the musical theories

A possible objection to making these comparisons is that from one point of view all these considerations are not relevant to the explanation of the musical scale. Nevertheless, from another point of view, we think that it is very important to be aware of the mythical, metaphysical and cosmological context of the musical explanations of Proclus. For this reason, we are presenting here several mythical implications of the vertical representation of the musical scale based on Pythagorean harmonics. For Proclus usually refers to its Apollonian character and connects the harmony that holds the world together as a divine light. Furthermore, Proclus himself considers the numbers and ratios that are the foundation of harmony and the scale, in relation to mythical/cosmological representations. For example his explanation of the Myth of Er has many references that link musical harmony and mythology, not only in the explanation that is concerned directly with the music of the Sirens, but also in passages such as the explanation of the numbers of days of the journey towards the axis of light (7 + 4 + 1 = 12, cf. *In Remp.* II.120.10), etc.

The connection between mythology, mathematics and music is possible because these disciplines are associated in some way with *phantasia* (imagination) understood as inner insight (or inner audition as well), where the Intelligible is projected as on a screen, as we shall see below. The Intelligible acquires a form of

[215] Cf. West (1992), p. 212 ff.

[216] On the symbolism of tuning (imposition of order), especially in relation to representations of King David tuning his harp or pslaterium with a tuning key, see Van Schaik (2005), pp. 44 ff. and p. 51-52. See also the Renaissance illustrations of the divine monochord by R. Fludd, *Utriusque Cosmi Maioris* (1617), p.90, where the divine hand is shown adjusting the tuning-peg. In another representation of the cosmic monochord by Fludd, in the same work, p.100, the presence of the Sun at the monochord's peg symbolizes the apollonian character of the correspondence tuning = cosmic harmonization.

expression in the imagination, the productions of which imitate the intelligible realities. The imagination is the same faculty that grasps myth and that figures out mathematics, as Trouillard states.[217]

There are different degrees in the externalization of the archetypes and in the application of the imagination: in Proclus, the mythical images are not as external as in the Renaissance for example. He mentions the verticality of the scale and its Apollonian origin and leaves the picture of this symbolism to the imagination of the reader. On the other hand, theoreticians of music of the Renaissance, such as Gafori, present an image that contains all these symbolisms together in a more explicit way: in the case of Gafori, in the frontispiece of *Practica Musicae*, Apollo appears with his lyre and the serpent (or string) of the scale at his feet.[218] This will be examined later in more detail.

Consequently, we consider that the study of the mythological background of these theories helps us to understand the musical symbolism in a better way. The comparison of the Universe with a Lyre —Hermes', Apollo's or Orpheus' Lyre— is an ancient image disseminated in Greece through Orphism or Pythagoreanism and is probably of a Chaldean or Babylonian origin, related to astronomical conceptions (this can be seen in the fact that some of the names of string instruments are related to goddesses of the sky, such as Astarte or Ishtar). The myth of Cadmus and Harmonia (daughter of Aphrodite and Ares) is particularly tied to primordial music — Apollo and the Muses sang at their wedding — and Cadmus is said to have brought the Lyre to Greece. In this context, the origin of the Lyre is associated with Aphrodite *Ourania* of Phoenician origin (cf. Herodotus, 1,105). Amphion, who belongs to the same mythical cycle, built the walls of Thebes under the action of his Lyre playing.[219] Thebes had seven gates,

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[217] For Proclus, mathematics provides a valuable knowledge because it induces recollection of the Forms; this is possible because mathematical concepts and figures are images of the Forms; these concepts, etc. are accessible to our human intermediate nature because the soul projects in the imagination, as in a mirror, the mathematical ideas (*In Eucl*. 1.141.2-19). At the same time, myth and poetry play the same role because mythical symbols and poetical images also induce the recollection of the Intelligible and illustrate the levels of reality and the different parts that constitute the human being and his soul (cf. *In Remp*. I.73.11-16; 77.24-28 and 172.9-30). On the value of mythology see *Theol.Plat*. I. 6 p.29, 7-10 (cf. I. 4 p.21, 13-27). See. Trouillard (1982), Ch.II, especially pp. 44 ff. Cf. Sheppard (1980), pp. 145-161 and p .163 and Van den Berg (2001), p. 132 ff.

[218] See p.145 below. This representation is studied by Haar (1974) and Wind (1958), pp. 46-47; 50; 112-113, among others. We know that Gafori had read the *Timaeus* and Ficino's *Commentary* on this dialogue. Cf. Tomlinson (1994), p. 89.

[219] Both Cadmus and Amphion are heroes that bring harmony to the world, and in their legends the role of music as a power that creates *cosmos* is very important.

which is the number of the strings of the Lyre of Amphion.[220] In this mythic symbolism, seven is related to the seven planets, the seven days of the week, and the seven rays of the Sun (in some representations, cf. Julian, *Oration to the Mother of the gods* 12.30, where this author calls the Sun, "the seven-rayed" quoting Julian the Theurgist).[221]

For Proclus the role of number seven in the *Timaeus* is connected both with Apollo and Dionysos (cf. *In Timaeum* II. 197.14 – 198.14). The division of the Soul's harmony in seven main terms is related to Dionysus; the harmonization and reunification of this multiplicity corresponds to Apollo.

Thebes can be conceived as a mirror of the Universe, constructed with the help of the music of the Lyre. The fact that it has seven gates shows that the structure of the Universe is conceived as having seven main levels, the gates of which the soul has to pass in its ascent, until arriving at the door of Apollo, who according to Aeschylus was one of the guardians of the doors in *Seven against Thebes*:

> lord Apollo, the reverend leader of the seventh, took for himself the seventh gate. (v. 800, transl. H.W.Smyth).[222]

Proclus, in his *In Timaeum* II.197.30-32, calls Apollo by the same name used by Aeschylus: "*Hebdomageta*" and refers to Apollo's birth on the seventh day. Plutarch says that Apollo's name means Unity for the Pythagoreans (cf. *De E ap. Delph*. 393b-c and *De Is. et Os*. 354f and 381f), but also according to Uzdavinys,

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[220] We shall consider later the Lyre of Hermes, which was a four-stringed instrument (Macrobius, *Sat*.I.19; or seven-stringed, *Homeric Hymn to Hermes*). The number of strings in a lyre or kithara (or a violin) depends not only on musical reasons, but also on arithmological and cosmic ones; in this case, seven is related to Apollo but also to Ishtar. Other instruments like cymbals (related to the symbol of the mirror) or bells, also have symbolic connotations, because they represented in their diameters measures in the Universe, i.e. cosmic distances or cycles. The common diameter of 150 mm has a cosmic meaning in different cultures. The musicologist Sachs (1940) has studied systematically the origin of musical instruments and Schneider (1998) has written about the symbolic animals related to different instruments.

[221] Cf. the same work, 12.9 where Julian mentions that the rays are anagogic. Cf. also Julian, *Hymn to King Helios*, 39.22 and 7.14 where he depicts the rays as the summit (*akron*) of light, as if they were the flower of light (*anthos*), which is incorporeal. It is meaningful that Proclus and other Neoplatonists often associate the flower and the summit, i.e. the "flower of the soul". Cf. Wallis (1972), p. 153, on the Chaldean origin of this symbolism. In the case of the musical scale of the *Timaeus*, its *akron* is the Monad, the first musical note of the descending scale.

[222] Seven is also a number consecrated to Athena. Another detail of importance in the mythic depiction of Thebes is that its walls were circular; in the same way, the island of Atlantis was divided in seven circles according to Amelius (cf. Proclus, *In Timaeum* I. 76.25-30, quoting Amelius' correspondence between the circles and the planets). However, for Proclus, the number 14 (as double of seven) is a symbol of the sublunar world and the level of change (genesis), cf. *In Remp*. II. 238.21-239.14. It is adequate then to represent the opposition of this level with a fight between seven attackers and seven defenders.

its Akkadian etymology, *abullu*, Aramaic *abul*, means "city gate".[223] Apollo then is the god of the Sundoor[224]; a detail that may seem unconnected to our topic, but if we think that the ancient rites related to the Sundoor and the Gate of Heaven (*Ianua Coeli*) were complemented with the idea of climbing a ladder (usually of seven steps), we can see the link with the cosmic musical scale. Numenius interpreted the chasms in the sky (*chasmata tou ouranou*) in the myth of Er in the *Republic* (614d) as concerning the "Gates of the Sun" (cf. Homer, *Od*. XXIV.12) and Proclus quotes him in his *Commentary* (*In Remp*. II.128.26 ff). It is also important to keep in mind that Pythagorean arithmetic is consecrated to Apollo, and mathematics are like a ladder in the ascent to the Intelligible as Proclus says in his Prologue to the *Commentary on Euclid's Elements* (Prologue II, 84.17).

A musical note opens (like a gate) the passage in the ascent, towards the higher level that follows (and according to the mythical background mentioned above there are seven gates). The fact that Proclus prefers to convey the *Timaeus* scale in a descending way shows that, for him, the descent of sound represents metaphysically the descent of the divine influence which resides on top of the ladder of reality; in the same way that musical inspiration comes down from Apollo and the Muses.[225] Nevertheless, the elevating power of music helps the soul to traverse the levels upwards.

Divine paradigms of the musical scale

In the section of the commentary where Proclus identifies Apollo and the Hebdomad, he is studying the divine paradigms of the division and harmonization of the scale:

> [The Demiurge] divides the soul by virtue of the portions, and harmonises the things that have been divided, and brings about their concord with one another. In doing these things, he is active at one and the same time in both the Dionysian and Apollonian manner. For to divide, to convey wholes into parts, and to preside over the distribution of forms is Dionysiac. But to harmoniously bring all things together into something complete is Apollonian. Therefore, since the Demiurge

[223] Cf. Uzdavinys (2008), p.97. According to Hrozny (1940), the name of the Hittite god Apulunas derives from the Babylonian word for gateway.

[224] Cf. A.K. Coomaraswamy, "The 'E' Apud Delphi" in (1977b) and section "The Sundoor and Related Motifs" in (1977a). It can be added that Artemis is the Roman Diana and this shows that there is a relation between Janus-Jana and Apollo-Artemis.

[225] There is no tendency among Greek theorists to set out scales from the top down. Nicomachus presents the scale from the bottom up in *Ench.* ch. 12 (cf. Arist. Quint. I.6). For a different point of view see note 153 above. Medieval and Renaissance planetary scales place the highest note at the top following Boethius' interpretation of Cicero (*Inst.Mus.*1.27); see p.66 above.

> simultaneously encompasses within himself the causes of both of these gods, he also divides the soul into parts and harmonises it, for the number that is common to both of these is the Hebdomad, since the theologists say that Dionysus was divided into seven parts:
> All the parts of the lad were into seven divided (*Orph. frag.* 210)
> And the Hebdomad is referred to Apollo since it is such as to connect all the concordances, for the double-octave is one monad, one dyad and a tetrad, which add up to seven. (II.197.15-30)

The double-octave (1-2-4), contain ratios composed by numbers that add up to seven (first octave = 2/1 and the second octave = 4/2), then is considered a paradigm of the harmony of the scale, because it unifies all the intervals and corresponds to the Dionysian and Apollonian activity of the Demiurge. It can be said also that there are seven notes in two tetrachords taken together corresponding to a seven-stringed lyre.[226] Planetary scales are usually composed by these seven notes and the note that completes the octave, which corresponds to the sphere of the fixed stars.[227] The last octaves of the scale of the *Timaeus* — which are completed, in both cases, by an eighth note— will involve this qualitative division of the octave, where each note can correspond to one of the seven planets; but the first two octaves (the paradigmatic or divine double-octave 1-2-4) —although they contain tones and semitones— can still be considered as an undivided unity that contains all the intervals, which corresponds to Apollo and Dionysos (cf. diagram 1 on p. 122). The rest of the scale of the *Timaeus* will mirror this paradigmatic double-octave. The second part of the scale that comes after a fifth that shows a transition (between the terms 4 and 6) continues with the octave between 6 and 12, still taken as a unity (the undivided heaven of the fixed stars), in the sense that its notes are not assigned to the planets yet (in the Middle Ages or in the Renaissance, this octave is sometimes assigned to the Angels, etc.).

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[226] Nicomachus' planetary scale in *Ench*. ch. 3 contains two conjunct tetrachords in the diatonic genus, see Barker's diagram in (1989) p.253 note 28. Nicomachus' planetary scale spans only a seventh, not an octave as in other authors who include the sphere of fixed stars; Philolaus' scale, explained by Nicomachus in ch. 9, as having only seven notes, spans a full octave (see note 70 *ad loc*. in Barker (1989), and cf. n. 34 on p. 37). The seven notes of Nicomachus' tetrachords correspond to the seven planets; the invention of the complete octave system is attributed by Nicomachus to Pythagoras (ch.5); this eight-note cosmic system allows the inclusion of a note for the Heaven of fixed stars; in this case the eight notes correspond to the "ogdoad", called "embracer of all harmonies" and "Cadmeia" (*Theol. Arith*. 73). Although the Earth is usually silent, however, a note for the Earth can be found in extended versions of the planetary scale. If these cosmic scales span a double-octave, the second octave corresponds to metaphysical or supracosmic levels (angels, muses, etc.). The different octaves of the *Timaeus*, can be interpreted as containing different levels of reality; its long range contains levels above the heaven, a heaven of heaven, assigned to higher states of being.

[227] It can be said also that an eight-note scale contains only seven intervals or ratios, as Proclus says: "the intervals are one less in number than the terms", *In Timaeum* II.187.14.

This octave represents the heaven or the circle of the same (in the sensible Universe). The next and last octave 12-24 (plus the additional tone 24-27), is the only one "divided", in the sense that is assigned to the planets or the harmony of the spheres. We will try to explain in this chapter how it is possible to interpret the scale in this way.

The structure of the scale as a whole is related also to the number seven because its main "portions" or terms are seven: 1; 2; 3; 4; 8; 9; 27.

Proclus indicates that the relation between the Soul and the Hebdomad is not arbitrary; it is established in the relation between the Soul and the Demiurge, and this metaphysical fact is expressed analogically in numbers and harmonic ratios:

> Once more, then, the fact that there are seven ratios entails that the portions [set out from the psychic stuff by the Demiurge] be numbered by the Hebdomad, for the soul is hebdomadic through and through: in its parts, in its ratios, in the circles — being seven-parted, seven-ratioed, and seven-circled. For if the Demiurgic Intellect is the monad, and if the soul proceeds primarily from Intellect, then it will have the ratio of seven to the Intellect since the number seven has a father and no mother. (*In Timaeum* II. 202.30-203.6)

The comparisons mentioned above had indicated the importance of Apollonian symbolism for Pythagorean music, and especially the central role that the Sun plays in this theory. All these images and notions are connected: illumination as harmonization of the world, the active role of the sunray and the vertical musical scale, and the complementary idea of "mirroring" of the levels manifested as a result of a process of creation understood as procession of spiritual light and sound (harmony). In this context, music assists the Demiurge in the process of making the image similar to its paradigm, the lower levels to the higher levels. As we are going to see in Chapter IV, music, because of having a celestial origin, when it appears reflected in this world, recalls the spiritual reality from where it comes, thus, being able to lead back the soul to its home — its origin — which is shared with music as well.

The demiurgic divisions of the mix and substance of the World-Soul are the basis for the analogical symbolism of the levels of the scale, with its proportions and spatial representations. For Proclus, this is related to space as a metaphysical category of differentiation, with the distinction of analogical allotments to particular gods and goddesses (cf. *In Timaeum* I.160.26 ff). In *In Timaeum* I.136.9 ff., Proclus studies the relation between cosmic divisions and divine lots, stating that "the All has been divided by the creational (demiurgic) numbers: dyad, triad,

tetrad, pentad, hebdomad, dodecad." Accordingly there is a single creation followed by a division in two (Heaven and generation) and afterward by a division in three allotted to Poseidon, Zeus and Hades (a division that in Proclus' *Commentary on the Republic*, II.238.21-239.14, corresponds to three levels of Sirens). After this comes the "fourfold distribution" (I.136.30), which according to the Pythagoreans, says Proclus, is composed by the levels of a) heaven, b) "ether", c) over the earth and d) below the earth. This is followed by the five-part division:

> for the cosmos is one, established out of five parts, and divided up both by shapes [five regular solids, *Timaeus* 55d] and their own gods in charge of them: heavenly, fiery, airborne, water-dwelling, and terrestrial. After this allotment comes the seven-part one. Starting up above with the inerrant sphere, the heptad wanders through all the components. In addition to them all is the allocation of the universe along the lines of the dodecad. (*In Timaeum* I.137.1 ff.)

In the following sections of his *Commentary*, Proclus will explain that these divisions are musical divisions as well. A conception like this is the source for Medieval and Renaissance cosmic scales, which include all the levels mentioned by Proclus. Another important aspect that results from this conception is for example the priority of the *pempadic* division over the *hebdomadic*, which has important connotations for the musical origin of the seven-days week which is ordered according to intervals of a fifth (or descendant fourths). It is certainly not possible to assign an "origin" to these doctrines; in this particular case the musical arrangement of the days of the week is attributed by Dio Cassius (*Roman History*, XXXVII.18-19) to the Egyptians and by others to the Chaldeans, etc.[228] This example shows a correlation between the divisions of space and those that belong to time, cyclical in character. This is a problem dealt with by Proclus in the same section quoted above (I.137.26 ff.), because while the divine lots have an unchanging nature proper to the gods that providentially are in charge of them, things in the world of generation are subjected to flux and change. According to this, the category of space seems to have in one sense a containing and preserving role; while time (with the corresponding notion of movement) is a category intrinsically related to succession and change.[229] The harmony of the World-Soul is a combination of these two categories. The qualitative (because every musical

[228] Cf. Odom (2005).
[229] As F.Schuon (1990), p.82, expresses it, "space differentiates and conserves; time changes and transforms".

note is different) and symbolic aspect of the different "spaces" or "places" in the scale can represent the divine allotments in the flux of the music.

The example of the days of the week (or other Calendars as well, e.g. Proclus' reference to Apollo's birthday on the seventh day mentioned above), expresses the interrelation between space and time. The Demiurge in the *Timaeus* resorts to divine number and music as essential for creating a harmonic whole in a sensible world, where flux is the main characteristic. The intermediary status of Mathematics, the principles of which are the correlated pair "*peras*" and "*apeiron*", limit and unlimited, makes possible the unification and harmonization of the cosmos, following the traditional mathematical sciences and harmonics of Pythagoreans such as Philolaus and Nicomachus of Gerasa.

Metaphysical interpretation of the scale. Music and the principles of peras and apeiron

The notion of space studied above seems to correspond in a way with "*peras*" because it differentiates allotments, and puts a limit to the wearing away proper to time. On the other hand, since divine space contains and guards everything, there is a higher sense in which space can be identified with "*apeiron*" in the sense of "*periechon*",[230] which corresponds to the saving influence of the enveloping Heavens. Nevertheless, in this case *apeiron* corresponds to the *apeiria* proper to the level of the First Principle (*arche*), and belongs to Eternity as a source of time (transcending and resolving the oppositions that occur in time). That level is more precisely a place where "time becomes space" as Wagner says in *Parsifal*, when Parsifal approaches the castle of the Grail. That ideal realm is expressed in music for strings, the experience of which puts us in contact with the idea of the spiritual container of reality, the *apeiron* of the harmonious Apollonian light.

On the other hand, "*apeiron*" on the derived level corresponds to time, as the expansion and procession where the single creation that belongs to the Monad is unfolded and takes place in a successive way. The Monad of the Soul contains the whole manifestation in a monadic way, in a unity that is a reflection of the intelligible Harmony.

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[230] Anaximander, the Pythagoreans and Anaxagoras, connected the concept of "*apeiron*" to the notions of cosmic container and cosmic respiration. Cf. Anaximander DK A 11; A14; A15 and12B1; Anaxagoras 59B2 and B14; doxographic report in DK iii. 348. Cf. Kahn (1994), pp. 97 ff. Cf. Huffman (1993), p. 213, on the relation between *apeiron* and breath in Philolaus.

The First Principle is represented with Silence, and from that silence there is a manifestation of sound, which can be understood as a descending ray of intelligible Harmony (which is inaudible as well, at least with the ear of the body), and from there the procession of sound is projected into the Soul; first in its centre and Monad (like the ray of light over the primordial waters) and from there the Soul vibrates in circles and produces the Cosmic Harmony that according to the Pythagoreans can be perceived with the ethereal vehicle of the soul.[231] This process of unfolding can be represented also as a descendant musical scale. The octaves proceed doubling the first note according to a duple and triple progression; this dyadic process is related also to the principle of *apeiron*. However, since this progression is divinely guided, it occurs according to harmony and cyclical periodicity, which corresponds to the principle of *peras*. There is an interrelationship of *peras* and *apeiron*, time and space, and the corresponding sciences.

Peras and the principle of rhythm, apeiron and the principle of creative expansion

The notion of movement and the passage from quietness to sound are important concepts. The numbers of arithmetic are put in movement and relation (reunifying their division as discrete quantities) by movement and vibration, proper to music (harmonics). This vibration follows a rhythm and in the Pythagorean cosmology, the whole process is explained as a cyclical cosmic respiration of the Ether from outside the Heavens.[232] We have discussed above (pp.54 ff.) the Pythagorean-Neoplatonic notion of mathematical movement and how this relates to Archytas of Tarentum, who classified the Mathematical sciences as four "sister" sciences (Fr.1 DK) using language similar to *Republic* VII 530d, already quoted, where Plato says that music and astronomy are "sister" sciences. The four sciences are: arithmetic, geometry, music (*harmonica*) and astronomy.[233]

In the cosmogony of Philolaus,

> the central fire attracts breath and other unlimiteds (e.g. time and void) from the surrounding unlimited and these are combined with limiters to produce the famous Pythagorean cosmos (…) these combinations do not occur in a haphazard way but they are fitted together ("harmonized") according to mathematical proportions, and accordingly the cosmos is intelligible in terms of mathematics. (Huffman [1993], p. 211).

[231] Cf. O'Meara (2007).
[232] It is important to keep in mind that "ether" is the medium of diffusion of sound, especially of stringed instruments (on ether see notes 262 and 369 below). On cosmic respiration in the Pythagoreans and Philolaus, see Kirk, Raven, Schofield (1983), p. 341 and note 230 above.
[233] See note 126 above.

As Huffman remarks,

> the Pythagoreans *identified* the creation of the world with the generation of numbers, and thought of the first step in the generation of the cosmos [the central fire in Philolaus Fr.7] as identical with the generation of the arithmetical unit (*ibid.*).

Huffman continues presenting Aristotle's account (in Fr.201) of the cosmogony of the Pythagoreans; he explains that the world is originated by breathing in unlimited time, breath and void, which distinguishes the place of each thing in each case. According to this explanation, a series of unlimiteds are brought in from the unlimited and in combination with the activity of the limit produce the harmony of the cosmos: e.g. fire acting on breath (and air); or void as an essential component for producing plurality and the different places for each thing, by means of separation and division of the continuous. According to Aristotle *Ph*.213b26-7, this happens first in numbers, because the void distinguishes their nature. In a similar way, unlimited time, by way of breathing, becomes rhythm and the measurement of the movement of the heavenly bodies.[234]

Kahn, interpreting the same testimonies studied by Huffman, says that in this cosmogony, numbers are at the same time "universals and privileged particulars". According to Kahn's reconstruction of the cosmogony, the "first one" corresponds to central fire and "two" is the celestial fire, "the outer ('higher') limit of the cosmos, thus completing the celestial octave (2/1)".[235] We can see that mathematics and cosmogony are intimately related; numbers, musical intervals, void, space and time, etc. are connected in a harmonization that creates a living universe (produced by breathing).

Pythagorean cosmology, in following the derivation of the mathematical sciences, makes possible the connection between the four sciences and the categories of space and time mentioned above. Arithmetic and music (harmonics) are connected to time, and geometry and astronomy to space.[236] On the other

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[234] See Huffman (1993), pp. 211-213 for a more detailed account of Philolaus' cosmogony.

[235] Kahn (2001), p. 28.

[236] Astronomy is also connected to time, because it studies magnitude in motion (Nicomachus, *Introd*. 1.2 ff. and 3.1-2). The Pythagoreans identified time with the sphere of the encompassing (Arist. *Phys*.218a33; Aet.I.21.1), and the breathing of the all has a rhythm and introduces intervals in time. Consequently, number measures the movements of the heavens and time should be studied in relation to multitude or quantity, which is the object of arithmetic. However, arithmetic studies absolute quantity, and it is music the science that studies relative quantity, in motion (audible motion, according to Plato, *Rep*.VII 530c; while astronomy studies visible motion). Archytas considered that time and movement can be explained in terms of proportions (Huffman [2005], pp. 519; 533) and music studies proportions and rhythm, which for Plato is the order of movement (*Laws*, 664e8; cf. other definitions of rhythm in relation to time in Barker [1989], p. 433 note 154). Archytas said (Fr.1) that all the sciences are akin to one another (and Plato followed him in the

hand, arithmetic and geometry are considered motionless, and in Pythagoreanism, where numbers are qualitative principles prior to being quantitative principles, the relation between arithmetic and geometry appears as essential because, for example, the triad and the triangle express the same intelligible principle. The triad is a higher reality than the number three of calculus and a triple division in matter. Music and astronomy belong to a level in which relation and movement takes place and they presuppose the two previous sciences. However, according to different foundations for the classification of the sciences, music can follow arithmetic, being thus closer to it than geometry, which in that sense appears as having a more derived status.

Plato proposes the following order of exposition of the mathematical disciplines: arithmetic, plane geometry, solid geometry, astronomy and harmonics (*Rep*. VII, 521c ff.). Nicomachus (*Introd.Arith*.2.4-5 and 3.1-2) presents the basis for the structure of the *quadrivium*, according to which the objects of study of arithmetic and geometry are respectively quantity (*poson*) and magnitude (*pêlikon*) in an absolute sense (in itself) and at rest; on the other hand, music and astronomy study the same objects in a relative sense and in movement.[237] As O'Meara pointed out, Iamblichus followed Nicomachus' principle of systematic quadripartition of the sciences, which arranges them according to the essential characteristics of their objects.[238] For this reason, the grouping of disciplines known as Mathematics is not an accidental conglomeration but follows a principle and has a structure.[239] The sciences follow the ontological (and logical in a metaphysical sense) order of derivation of reality, as Iamblichus explains. The derivation of the mathematical sciences is based on the derivation of their objects; although this seems to produce some inconsistencies on how to arrange the sciences in a hierarchy. O'Meara represents the four mathematical sciences in descending order and says:

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comparison between harmonics and astronomy) and one could study the "visible motions" in relation to an astronomical model (armillary sphere) arranged in space and put it in motion with the consequent dimension of time and the harmonic proportions of their relative speeds (audible motions). Music and rhythm presuppose time and succession; and also the structure of harmony and proportion can surround the musical intervals in a structure that has a spatial dimension as well (also playing an instrument or the arrangement of a group of players or an orchestra involves a spatial diffusion of sound).

[237] Cf. *Introd. Arith.* Ch.I-III, p. 1-9 Hoche. For the introduction of movement in the realm of mathematical being see Merlan (1968), 15 ff. and 21 ff.

[238] O'Meara (1989), pp. 45 ff.

[239] Cf. Merlan, *ibid*., p. 89.

> This is how Iamblichus tends to treat them, namely as if they correspond to four sub-realms of mathematical reality, each of which is derived and inferior to the higher. Thus, numbers would be higher than, and the sources of, geometrical figures, and so arithmetic will be correspondingly fundamental and prior to geometry. Must we then conclude that the objects of astronomy derive from the objects of music?[240]

Proclus follows Nicomachus as well, but he presents the sciences in the following order, which he characterizes as "Pythagorean":

> Arithmetic, then, studies quantity as such, music the relations between quantities, geometry, magnitude at rest, spherics (astronomy) magnitude inherently moving. (*In Euclid*. 36, transl. Morrow)[241]

A clear derivation, following the order mentioned by Proclus, can be found in *Theologoumena Arithmetica*, with music in the second place among the four sciences:

> 'Four are the foundations of wisdom— arithmetic, music, geometry, astronomy— ordered 1, 2, 3, 4.' And Cleinias of Tarentum says: 'These things when at rest gave rise to arithmetic and geometry, and when moving to harmony and astronomy.'" (*Theol.Arithm.* 20) (Transl. Robin Waterfield)[242]

The derivation of the mathematical sciences is a symbol of the metaphysical process of manifestation from divine Principles. These sciences are behind the explanation of the derivation of the Universe from the Unity, which can be expressed in an arithmetical and musical way (a musical scale based on mathematical proportions), because they have an "exegetical" character. Mathematics has an inner and an exterior side. Ruth Glasner has pointed out the exegetical character of mathematics in Neoplatonism and especially in Proclus: "…Proclus worked out an 'exegetical' conception of mathematics, in several respects similar to his exegetical conception of language."[243]

Another important aspect concerning the sciences is that geometry can be understood as the key science in the *quadrivium*. This is because geometry expresses with clarity that number is conceived in Pythagoreanism as a qualitative and intelligible principle, and not just a practical instrument of calculus (because it

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[240] O'Meara (1989) p. 46. Cf. note 51 for different sources on the principles of ordering mathematical sciences, as for example Proclus *In Eucl*. 38, 1-12.

[241] Proclus mentions afterwards Geminus' classification of the sciences (*In Eucl*.38).

[242] See Theon of Smyrna, *De Util*. 16.24 (Hiller), on the order of study of the mathematical disciplines. For him, one part of musical science ("music in numbers") is studied straight after arithmetic, while the other ("music in the cosmos") is placed at the end along with astronomy.The sequence "arithmetic, music, geometry, astronomy" reappears in Cassiodorus' *Institutions* and in his *Letters*; on the other hand, Isidore of Seville presents geometry before music; on these authors' conception of the *quadrivium* and a quotation of their texts, see Hadot (2005), Chapter IV, which also gives an account of St. Augustine's and Martianus Capella's views on the liberal arts.

[243] Glasner (1992), p. 331. For Proclus' exegetical conception of language see Sheppard (1980), especially Chapter four: "Allegory, Symbols and Mysteries", pp. 145-161.

has the analogical value of evoking higher intelligible principles). This explains the importance that geometry has for Plato and especially for Proclus, who commented on the *Elements* of Euclid and wrote a treatise on metaphysics —his *Elements of Theology*— following Euclid's method and style as an analogical way of expressing metaphysical truths.[244]

Music also expresses the qualitative aspect of number, since it is also based on arithmetics and the principles of number, *peras* and *apeiron*. Plato explains in *Philebus* 17a-e, in which sense number determines quality in the indefinite character of sound, directing and articulating multiplicity in musical systems (*systêmata* or *harmoniai* with different qualities or intervallic structures), which are able in this way to manifest unity and order, as a reflection of the principle of Unity.[245] Music, then, understood not only as a human science but as a cosmological aspect of the World-Soul —which transmits the causal activity and influence of the principles of *peras* and *apeiron* to the sensible world— serves a similar function to that of geometry regarding the impostion of form and structure on indeterminate *continua*.[246]

This causal aspect of the mathematical sciences can be seen in a text by Proclus which explains, in relation to geometry, that the Soul's *dianoia* (understanding) is like an illuminating faculty; its "light" comes from the Platonic Ideas contained in the Intellect, and projects them, in turn, "on the screen of imagination (*phantasia*)" (*In Euclidem*, Prologue II, 56, 14).[247] In the same work (1, 141, 2-19), Proclus compares imagination with a mirror:

> Therefore just as nature stands creatively above the visible figures, so the soul, exercising its capacity to know, projects (*proballei*) on the imagination (*phantasia*), as on a mirror, the concepts (*logoi*) of the figures, and the imagination, receiving the figures in the form of images (*eidôla*) and containing reflections (*emphaseis*) of what is within the soul, by their means affords the soul an opportunity to turn inward from the images (*eidôla*) and to attend to itself (*eis to eisô strophe kai pros heautên energeia*). It is as if a man looking at himself in a mirror and marvelling at the power of nature and at his own appearance (*morphê*) should wish to look upon his actual self (*heauton*) directly and possess such a power as would enable him to become at the same time the seer and the object seen. In the same way, when the soul is looking outside itself at the imagination, seeing the figures depicted there and being struck (*ekplagênai*) by their beauty and orderedness, it is adoring its own concepts from which they are derived; and though it adores their beauty, it dismisses it as something imaged (*en eidôlois*) and seeks its own beauty and wants to go past it to the inside. (transl. G. Morrow).[248]

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[244] Cf. O'Meara (2005b) and Lowry (1980).
[245] See Barker (1989), p. 63, note 34 and (1996).
[246] Cf. Huffman (2005), p. 70.
[247] On *phantasia* and the simile of the mirror cf. Sheppard (2003). Cf. also the same author (1995) and (1997). Cf. also Sorabji (2004), pp. 61 ff.
[248] Quoted in Sorabji, *op.cit*. p.68-69.

We can apply what Proclus says here, to music. For music belongs also to mathematics and the *logoi* that the soul projects are musical proportions as well and music draws the soul towards its inner essence and beauty. On the macrocosmic level, the World-Soul and its imagination contain as it were an interior blueprint of the sensible world, which is *actively* produced by Nature, according to *techne* (art). Art is here understood in the sense of the operation of the World-Soul and Nature, which is the model for the operation of human art. (Cf. *In Timaeum* I.336.3). The musical scale of the World-Soul is also another plan of the sensible harmony, and not only understood in the external way that the metaphor suggests. It is more appropriate to imagine this scale as an inner harmony that comes from the essence of the Soul (its very being) and proceeds to resonate and vibrate (following, or better creating, the rhythm of time). It is in this sense that the World-Soul's scale of the *Timaeus* contains everything as an image, and in its vertical arrangement of musical levels mirrors the different levels of the cosmos.

The complementarity between geometry and music, based on the categories of rest and movement (as can be found in Nicomachus, see p.104 above) can be related also to the categories of space and time, as we have already seen. The notion of form as a source of order in the visible world corresponds to a spatial/geometrical symbolism, but it is possible to apply a symbolism of sound, where order is understood as harmony proceeding from numbers and producing rhythm; in this case, related to time and temporal symbolism (because time is the number of movement). Nevertheless, harmony and the structure of the scale can portray as well spatial levels in the universe, and therefore the scale is able to represent the "emanation" or manifestation of the universe, as the product of the divine operative power symbolised in terms of creative "word", or resonating "music" or "poetry" (Apollo and his Lyre, or Zeus and the Muses).[249]

[249] The role of Apollo considered as the cosmic musician or poet is well-known. Zeus is also a god that harmonizes the world. Pindar's fragmentary *Hymn to Zeus* (*Hymnos* 1 in Snell-Mähler's Teubner edition of Pindar's fragments) related the wedding of Cadmus and Harmony and how Apollo was present and sang a Hymn of praise to Zeus. The poem depicted how all disorder in the world was reduced to harmony by Zeus and that when everything was already beautifully ordered, the gods, mute in amazement, asked Zeus for a divine voice who would sing the marvel of the world, with word and song. And then Zeus created the Muses. The myth can be understood according to a temporal succession, but also in the sense that the order of creation is not complete without music and was not possible without harmony existing already in the Intellectual operative power of Zeus. Cf. Snell (1982), p. 71-89 (especially 77-78) where this *Hymn* is examined thoroughly.

In the first case (spatial symbolism), the idea of projection explains the process of manifestation as a ray of light, which coming from the First Principle, gradually produces the visible world and maintains it in unity because of being in orientation towards the Source of reality. For in its return it draws back the reflection towards the archetype. As we have mentioned at the beginning of this chapter, the same notion of "ray" can be understood as a string that gives a high-pitched sound that corresponds to the first musical note of the scale (in the *Timaeus*, this is the E sound). This note resonates and creates the different levels or grades of the scale. At the same time the different notes of the scale can be explained as a result of the division of the musical string. Accordingly we can understand Proclus' notion of the projection of mathematical reality on the imagination in musical terms as well. The relation between the metaphor of projection of light and the metaphor of resonance of sound can be considered in relation to another idea mentioned before, that of the mirror,[250] if we notice that in Ancient Greece mirrors were generally made of bronze. Both a mirror and a cymbal usually have the same shape and one reflects light while the other makes sound resonate. It is relevant also that both instruments were related to the cult of Dionysos and Orphism.

The circular form of the mirror suggests the notion of space, form and geometry, while the cymbal shows the same circular form but in activity, and recalls the ideas of vibration, movement according to harmonic waves and resonance (and the numbers that explain these vibrations in terms of proportions). The mathematical derivation of reality unfolds the ideal reality of number and form in terms of harmonic vibration and relation between numbers, in direction to external movement and the manifestation of physical reality (astronomy). In one sense, the metaphor of the string presents the idea of division, composition and extension (interval) which are conditions of the sensible world; on the other hand the resonance, especially when understood as musical sympathy and as a filling harmony, suggests the idea of unification and binding.

In any case, both visual and auditory perception are related to projection (*probolê*) and for Proclus, sense perception in general depends on a previous inner insight that resides in the faculty of *synaisthêsis* in the soul.[251] The external

[250] See Sheppard (1997), for the metaphysical implications of the notions of mirror and mathematical projection in Iamblichus, Proclus, etc. pp. 116 ff. in particular. Cf. note 247 above.
[251] Cf. Trouillard (1982). On *synaisthêsis* in general see Sorabji (2004), p. 159 and 134 ff.

reality is composite and extended. In the interiorizing path of the soul (which follows the thread of projection backwards), the objects of *phantasia* still possess form and figure (with extension, *diastema*, which is also the word for musical interval). Nevertheless, because of their character of "projections" they remind the soul of "the incomposite and unextended principles found in the rational part of our soul", which in turn reflect the true archetypes which are the Demiurgic Forms.[252]

In this process of interiorization for the soul, the faculty of *synaisthêsis* brings it to a further step in its concentration towards the Intellect. This faculty shares with the Intellect the ability of intuition and awareness of an inner or immaterial reality. There is an intimate relation between *synaisthêsis* and music, as Proclus says in his *In Remp*. He explains in II.241.19-243.27, how Er can see the *Moirai* (Fates) and hear their song even when it has an intelligible nature. It is interesting to note that Proclus' account depicts how the visual and audible manifestation of the goddesses occurs in the Ether, and through this means of diffusion reaches the imagination of the partial soul (certain instruments or music in general are depicted as putting the ether in movement).[253] Proclus is talking in the context of hieratic art, and affirms that

> […] visible symbols are traces (*synthêmata*) of invisible powers; and that which is seen with extended forms is the symbol of that without form. (*In Remp*. II.242.24-25)

Proclus mentions here the progression studied above (from the Intelligible to projections in the imagination): the extended can be a symbol of the unextended and Intelligible. The case of Er is an exception because he is "literally" seeing and hearing, because of divine inspiration, the unextended as extended:

> It is on behalf of the participants that what is incorporeal shows itself in corporeal form, manifesting itself in a spatial way in the ether […] the messenger of these visions [Er], who was using the imagination (*phantasia*), as is natural for a partial soul which still had in itself the notion of the corporeal, grasped in this way the incorporeal. His soul saw in a corporeal way, under the aspect of an ethereal body, the modes of subsistence (*hyparxeis*) of the incorporeals; that is, instead of seeing the divine and immaterial life he saw white tunics […]. (*In Remp*.II. 242.13-21)

Although this is a depiction of the exceptional case of Er, the same can be applied to divine science and art; as long as geometry or music are conceived as symbolic expressions of the Intelligible they allow our soul to see and hear what in reality is invisible and inaudible. It is meaningful that Proclus is thinking of

[252] Sheppard (1997), p.117, explaining Philoponus' *De Anima* 58.7 – 13.
[253] Cf. also O'Meara (2007). This author examines an explanation of how the soul can hear the harmony of the spheres, in relation to the soul's ethereal vehicle.

theurgic rites (*hieratikon ergon*) in this passage. He explains that the same thing that happens with divine visions can occur in relation to sound and music:

> […] to listen to a melodious voice, as well as hymns, is usual in […lacuna…]; the participated do not [operate] through a voice or [corporeal] organs; nor do they strike the hearing by means of [noises or clashes]; but by means of an incorporeal operation, in which their impassible activity, according to their will, produces a passive movement in the participant. […] It is then not impossible to conceive that when the *Moirai* sing in an intelligible way, their thoughts make a sensible effect on Er and his companions; and that the movement that makes no noise produces a sound; that the life that does not affect the hearing organs is able to be manifested by striking the ears and in this way passes from the intellectual intuition (*tês kata noun sunaisthêseôs*) into the apprehension of the hearing. (*In Remp*. II. 242.27-243.13)

Proclus repeats that this has to be understood in relation to the conception of hieratic art and explains that every being listens according to its place in the universe and its own receptive ability. He finishes this passage with the aspiration of developing a spiritual way of listening, and he uses again the term "*synaisthêsis*":

> […] when we are purified from the composition of our thoughts. Then, we shall perceive intimately (*hexomen synaisthêsin*) in a non-figurative way (*amorphôtôs*) the presence of the gods; only when we silence our corporeal perceptions (*sômatikais aisthêsesin*) will we be able to listen intelligibly to the divine voices. (II. 243.23-27)

If the notion of "*synaisthêsis*" can be applicable to particular souls, it is still valid if applied to the World-Soul that has not the same hindrances to its "inner perception" as that experienced by the particular souls.

The cognitive and creative aspect of the World-Soul mirrored in the musical scale

The Soul was defined by the first commentators of the *Timaeus* as essentially a number, a geometrical figure or a harmony; this meant that its nature is intrinsically connected to the objects of the mathematical sciences, previously to any schematic or sensible projection of them.[254] In this sense the World-Soul can perceive number, harmony, etc. and in the same act of perception or knowledge, can produce a reflection (a manifestation) of this knowledge (by its very being, *autoi toi einai*, *autophyôs*), because it is in the middle position between the essential and the sensible, as it were in the horizon. The World-Soul combines then a cognitive and a generative activity as Proclus explains in *In Timaeum* II. 205.2, commenting on the progression of the *Timaeus* (1-2-3-4-9-8-27 in the order

[254] Cf. Merlan's study of Academic definitions of the Soul and their influence on Posidonios and Iamblichus, (1968), pp. 34 ff. Cf. also the cognitive meaning of the Circles of the World-Soul in the *Timaeus* 36 d- 37 c, which accompany the harmonic and astronomical meaning of the same Circles. See Cornford (1937), pp. 74 ff. and 94 ff.

in which Plato mentions the numbers), and shows how its portions follow a mathematical derivation:

> Furthermore, the fourth portion (i.e. 4) and the remaining fifth portion (i.e. 9) exhibit in an appropriate way the fact that the soul presides over secondary beings. For these portions are the intellective causes of the incorporeals that have been divided among the realm of bodies, since they are planes (*epipedoi*) and squares – the former derived from the second portion and the latter from the third [2 x 2 = 4 and 3 x 3 = 9]. The fourth portion is [the cause of] procession and generation, while the fifth is the [cause of] return and of perfection.

Proclus means that 4 and 9 are in turn causes of 8 and 27, the following numbers in the progression, that represent solid numbers or cubes, already signifying the corporeal world. He continues his explanation identifying 4 as a generative cause (*gennêtike*) of parts in the corporeal world (or body) that are generative in turn, because they imitate (*mimoumenôn*) the procession of the productive ideas of the Soul. The fifth portion (9), on the other hand, is understood as a cause that generates parts that have a cognitive power, imitating the movement of return of the Soul:

> For all knowledge brings about the reversion of the knower upon that which is known, just as all generative nature is inclined to create and to have the procession taken downwards into the things below. (*In Timaeum* II. 205.15-16)

The musical assumptions behind these numbers or portions are respectively intervals of octaves (2/1) and intervals of fifths (9 is the triple of 3, which is a fifth in relation to 2 = 3/2). It is interesting to notice that 9 is the fifth portion (in Plato's order) identified with conversion, which is the typical feature of the interval of fifth in music.

Proclus explains more clearly in *In Tim.* 204.21 ff. (especially 25 ff), why he connects the second (2) and fourth (4) portions with procession and the third (3) and fifth (9) with conversion (or reversion). According to this passage, the associations are based on the nature of the proportional relations between 2 and 1; 4 and 2; 3 and 2 and between 3 and 1. The passage on the association between the third portion and the notion of metaphysical return says:

> The third [portion] conversely brings about the reversion of the entire soul to its first principle, and it is a third part of it that has been further unfolded in relation to the principles. On the one hand, it is measured by the first portion in as much as it is a further pluralisation of its unity, but on the other hand, it is also connected in a more partial way to the second unit, and for this reason it is said to be three times the former and one and a half times (35b6) the latter. The fact that it is composed from half of the second portion indicates that it could not possess equal power with it, while it is completely composed from the first. (*In Timaeum* II.204.25-205.1)

The connection between the ratio of the interval of fifth (3/2) and the conversion of the soul is stated more explicitly by Proclus at II.222.29:

> If it is necessary to put the matter briefly, then it may be said that just as Life proceeds from Being and as Intellect is united with Life and Being, so too surely the procession of soul has come to be from the reproductive cause, but the reversion takes place with respect to both. It takes place in the mode of the 3:2 [ratio] (*hêmioliôs*) with respect to what is above it, but in the mode of the multiple of three (*triplasiôs*) in relation to what is beyond that which is above it. It pertains to the form of reversion to both seek after the whole and to lessen division, which is something that the *hêmiolos* [3:2 ratio] surely does. For while the muliple of two (*to diplasion*) subordinates itself entirely to the dyad throughout, the *hêmiolios* [ratio] is proportional to the former, but it is also a ratio where there is a lessening of deterioration.[255]

Another important aspect of this scale based on the proportions between the portions is that some numbers represent notes that correspond to octaves that in a cosmic scale mirror the level of the Soul, while other octaves are already in the sensible world and correspond to the notes of each planet, etc.

We have then the notion that octaves express the procession, the expansion and mirroring of different levels; while the fifths produce a determination in the space opened by the octaves, with a perfecting capacity related to knowledge and Intellect.

We can see that the cognitive aspect of speculative music has as its aim the accommodation or return of the knower to the known; in the same way that the particular soul ascends through the spheres of the planets, it can ascend also in the musical scale from lower octaves to higher ones.

Proclus summarizes his study of the metaphysical meaning of the portions of the Soul with the following passage:

> In this manner the essence of the soul is seven-parted, in as much as it remains [*monê* = *monas*, first portion, 1], proceeds [2], and returns [3], and is the cause of both procession [4] and return [9], not only in essences divisible in bodies but also in the bodies themselves (8 and 27). If you like, it is because the soul has been allocated an intermediate (*mesên*)[256] sort of existence (hypostasis) between the indivisible and divisible things that it imitates the former through the triad of terms [1-2-3], while it has antecedently comprehended the latter through the tetrad [4-9-8-27]. But on the other hand, it is completely composed by all the terms, because the soul is entirely the centre of the Universe. (II.205.24 – 31)

The whole Neoplatonic metaphysics has a mathematical-musical expression in this passage. The last sentence means that the Soul contains all the levels expressed in all the numbers and notes of the scale of the *Timaeus* because being in the middle of everything it reflects the Intelligible and takes up the sensible world previously in itself as its archetype. This can be represented in a musical scale that in the Pythagorean way is generated with a set of fifths. In the planetary

[255] Thomas Taylor's transation of the last sentence says "diminishes the ratio of subjection", which helps us to understan the relation between the ratios 2:1 and 3:2; because 2 contains 1 twice and 3 contains 2 once plus 1/2 of 2.
[256] This word has also the musical meaning of middle note in the scale.

scale included in the whole diagram, the musical note (d) that represents the Sun, is symmetrically surrounded by the other notes (which would correspond to the inner and outer planets in a planetary scale; cf. pp. 65 and 69 above).

The note of the Sun symbolizes in the visible and audible world the central position of the World-Soul, as we shall see later (pp.136 ff). Also the note (a) that corresponds to the Heaven of Fixed Stars can express the power of the soul of containing everything inside, because it is the note that closes the octave starting in the Moon (a). The level of the Soul in itself (as a Heaven of Heaven) can be represented in a higher octave a-a, that usually corresponds to an octave of Muses or Angels in cosmic scales that will be studied later. Apollo in the top of the scale symbolizes the permanence of the One, source of the whole harmony.

The conception of mirroring levels then, is expressed in different octaves that mark the passages or lines of reflection (horizon) between one level and another, in this sense a expression such as "Heaven of Heaven" means what is the real Heaven beyond the one that we are accustom to consider the Heaven (or sky) (see *Phaedo* 109b-110e).

The contemplative value of symbolic music

Music has a particular aptitude of entering directly in that part of the soul that we referred to as *synaisthêsis*, or insight (inner hearing in this case), and for this reason the scale is a privileged symbol for an accommodation of the soul and the Intelligible. The particular soul is not able to access the Ideas and intelligible Harmony directly; however, the sensible perception of harmony and beauty of audible and visible things puts the inner perception (or inner sense) again on the trail of the Intelligible when the external (the sensible world that in the *Republic* is said to depend on the visible Sun) makes connection with the internal light of reminiscence (*anamnêsis*), following the thread or ray of projection of the World-Soul. On the other hand the World-Soul is always oriented to its Intelligible Sun, reflecting its light and echoing the inaudible harmony that surrounds it.

Consequently the universal mirror of the World-Soul is always shining and clean (able to resonate in the acoustic metaphor)[257], while the particular souls, closer to the divisible world, only see as if through blurred or covered (brazen) mirrors. In this sense the music reflected in the Harmony of the Spheres is more

[257] Cf. *Timaeus* 70e ff., and Sheppard (2003).

powerful than that audible with normal ears; however this doesn't lessen the value of the different levels of music accessible to particular souls, from speculative to audible music, depicted in the Pythagorean tradition of the *Timaeus*. On the contrary, the reason for audible and visible symbols is the necessity of the reflection and projection on the imagination of the soul (particular soul), that in this way is capable of rekindling and recuperating the concealed harmony and beauty that belongs to the inner sensibility.

Plato depicts in the *Timaeus* how the contemplation of the heavens and its counterpart in speculative music is beneficial for the soul:

> […] God invented and gave us vision in order that we might observe the circuits of intelligence in the heaven and profit by them for the revolutions of our own thought, which are akin to them, though ours be troubled and they are unperturbed; and that, by learning to know them and acquiring the power to compute them rightly according to nature, we might imitate (*mimoumenoi*) the perfectly unerring revolutions of the god and reduce to settled order the wandering motions in ourselves.
>
> Of sound and hearing once more the same account may be given: they are a gift from heaven for the same intent and purpose. […] that part of music that is serviceable with respect to the hearing of sound is given for the sake of harmony; and harmony, whose motions are akin to the revolutions of the soul within us, has been given by the Muses to him whose commerce with them is guided by intelligence, not for the sake of irrational pleasure (which is now thought to be its utility), but as an ally against the inward discord that has come into the revolution of the soul, to bring it into order and consonance with itself. (*Timaeus*, 47 b-d, transl. Cornford modified)

The musical scale (*harmonia*)[258] then, mirrors the Universe, for ontological and cognitive (and providential) reasons: ontologically, because it symbolizes that everything that follows the principles mirrors them (creatively), and cognitively, because when knowing the levels that followed the procession, the soul can ascend again through their causes to the One that has originated the whole continuous procession.[259]

Reflection and likeness are in Proclus' philosophy two notions that allow continuity in procession (Cf. *El.Theol*. Props. 28 and 29).[260] Conversely, the return "is also accomplished through a likeness of the reverting terms to the goal of reversion" (Prop. 32). Proclus states also that "all that proceeds from any principle and reverts upon it has a cyclic activity (*kyklikê energeia*)" (Prop.33).

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[258] "*Harmonia*" understood as the structure of the concordant ratios of the intervals of the scale. Cf. Cornford's note 4 to the passage quoted of the *Timaeus*, p.158. These ratios are essentially contained in the composition of the World-Soul and consequently in the divine part of the particular souls that comes from the same mixture made by the Demiurge for the cosmic Soul.

[259] Cf. Proclus, *El.Theol*. Prop. 25: "Whatever is complete proceeds to generate those things which it is capable of producing, imitating (*mimoumenon*) in its turn the one originative principle of the universe" (transl. Dodds).

[260] Prop. 29: "All procession is accomplished through a likeness of the secondary to the primary" (transl.Dodds)

These metaphysical principles can be represented very accurately in the musical scale because of the cyclical character of the fifths and the mirroring of the octaves. In several Renaissance cosmic scales different notes or octaves belong to different levels: the level of the four elements, the level of the planets and the higher levels belonging to heavenly intellects (Muses or Angels), crowned by Apollo or the Principle of all things.[261]

Another well-known example of the metaphor of reflection is the surface of the waters. The line of reflection represents the extreme (*akron*) of a level of reality that puts one level in contact with the following higher one.[262] Proclus emphasises Plato's statement in *Timaeus* 33 b, that asserts that the exterior surface of the body of the World is perfectly smooth (*leîon*) and shiny, showing that this

> smooth surface is the boundary that communicates to what is outside, and this is the Soul and before it the Intellect: the Intellect certainly is the boundary of the Soul, and before the Intellect, the boundary is the sole Deity that maintains the multiplicity in a continuous whole. (*In Timaeum*, II.80 ff.).

After this, Proclus mentions the Orphic symbolism of the mirror of Dionysos and he states that it represents the aptitude of the Universe for receiving the plenitude of the Intellect. He mentions that the Universe has a perfect disposition of receiving the illuminations that come from the Intellect and the Soul and really (spontaneously) (*autophyôs*, by its very nature, like a living plant, cf. *In Timaeum* II.80.15)[263] makes contact (*synaptêtai*) with them (with its glossy boundary). We can add that the Universe receives in this reflection the intelligible Harmony because Proclus says that "it is harmonized with the hypercosmic Lights because of the likeness to them" (*enarmozêtai pros ta hyperkosmia phôta dia tês pros auta omoiotêtos*).

It is interesting to note that in later musical portraits of the ascent of the soul, the last stage of the climax is represented by a clashing of cymbals. One of the

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[261] See for example Gafori, *Practica Musicae* (1496), frontispiece (diagram 4, p.145 below) and R. Fludd, divine monochord, *Anatom.Amphit.Effig.Trip*. (1621), p. 314-15. The concord of the elements is mentioned by Boethius, *Inst.Mus*.I.ii, 187.20 ff and I.xx, 206 F. as an essential feature of *musica mundana*, which also comprises the harmony of the heavens and the seasons. Cf. Zarlino, *Inst.harm*.12-17 for another Renaissance example of the reception of Boethius' *musica mundana*.

[262] Cf. Plato's *Republic* 402b and 510a, and especially the myth of the *Phaedo* 109b-110e. Plato distinguishes different levels of reality marked by a horizontal line, i.e. the *akra* of the waters, or the limit that marks the contrast between a sky of air and a true sky of ether. The consequences for music (Cf. Aristides Quintilianus, *De Musica*, II.18, 90.10) are the division of instruments that move the air and are moist (wind instruments, Dionysian; Aristides mentions Marsyas) and instruments that move the ether (strings, Apollonian).

[263] Baltzly translates "organically". Cf. Orphic *Hymn to Hyperion*: "*ouranion phôs, autophyês, akama<s>*",etc.

more noticeable examples of this is Wagner's Prelude to *Lohengrin*.[264] The strings represent the ethereal space of light of the Grail, and the clashing of cymbals the sudden contact of the boundary of the smooth surface of the heavens with the space outside. In connection to this it is important to remember the already mentioned (p. 76) symbol of the Apollonian Sunray (associated with the Lyre and monochord) as another expression of the procession of the principles and the reception of their illumination on the derived realities.

The scale as an all-embracing symbol

We have studied up to now how Proclus understands the musical scale of the Soul as a mirror of the whole reality. As we have seen, everything must be included in the Scale of the Soul because it was composed by the Demiurge as a copy of the complete Living Being Itself that he had as a model: first, the Soul must have an image of the Intelligible; secondly, it must be included in this musical picture of itself as the mediating principle; and thirdly it must contain the Harmony of the Spheres in an archetypal way.[265] The scale of the *Timaeus* is accordingly, a cosmic symbol of the whole reality reflecting the harmony of the Soul, the paradigm of the harmony of the world and the Demiurge together with the Intelligible model.

We have already quoted a text by Proclus[266], about the triple manifestation of harmony in the universe; it is significant to quote it again to show how these levels are reflected in the *Timaeus* scale:

> intelligible Harmony is manifested in a three-fold way. First there is 1) Harmony Itself. Then there is 2) that which has been harmonised in the primary manner and is this way throughout the whole of itself. Third, there is 3) that which has been harmonised in a secondary manner and participates in a way in harmony. One must refer the first to Intellect, the second to the Soul, and the third to the Body[of the World]. (*In Timaeum* II. 295. 2)

As we have seen, the principles of all harmony —the intelligible Harmony in itself— are epitomized in the *Tetraktys*. The scale of the *Timaeus* needs to contain all the levels of harmony. For this reason, it does not stop in the ideal level of the first *Tetraktys* (represented in the first two octaves, starting from the top; see diagram 1 on p. 122), but proceeds until the last tone represented in the number 27 in order to contain all the levels: the Intelligible, the Soul and the World. Proclus

[264] Another example of this is the controversial cymbal clash (and triangle roll) at the point of climax in the adagio of Bruckner's *Seventh* Symphony.
[265] Cf. Proclus, *In Timaeum*. II .207.20 ff.
[266] Cf. Introduction, p. 13.

explains the reasons for the extension of the scale in the following terms, quoting Adrastus[267]:

> Therefore, Plato makes the division of tetrachords in the diatonic genus, and proceeds not only as far as the octave, but in fact goes as far as [to provide a system] whose range is composed of four octaves, the fifth and a tone. […] But if one were puzzled about how Plato can extend the scale (*diagramma*) to such a great extent, Adrastus says – for Aristoxenus had restricted the extent of his variable scale (*polytropou*: 'manifold') to an octave and a fourth, because he accepts this interval [octave + fourth] as a consonance, 'giving the ear authority over the intellect' (*Rep.* 531b), while the modern theoreticians (*neôteroi*) extend the scale to two octaves with an additional tone in order to give fifteen notes – well, in reply to this puzzle it is necessary to say that the people who constructed these smaller scales did so with reference to our use of them [using the criteria of human utility], assuming that a range larger than this would make it impossible for the contestants to sing, or for the audience to discriminate reliably, assessing with their discerning faculty of perception. But Plato, looking instead to nature composes the World-Soul out of all of [the intervals in this extended scale] in order that the sequence should go as far as solid numbers seeing that the Soul is to be the ruler of three dimensional bodies. The seven terms (1, 2, 3, 4, 8, 9, 27) show the progression of the scale until the extension of four octaves and one fifth, as it is shown by the greatest term being 27 [which is the term that indicates the last tone]. This then will be the answer to the puzzle of the extension of Plato's scale. (Proclus, *In Timaeum*, II. 169.32-170.20)[268]

Proclus, following Adrastus, is clear in showing that Plato has metaphysical reasons for the extension of the scale. He chose the intervals having in mind the nature of the Universe (*physis*) and tried to symbolize its different levels with the scale's magnitude. In this sense, Plato is doing speculative music according to that *Musica Mundana* depicted by Boethius. The other theoreticians follow utilitarian or sensible considerations, and then they are on the level of *Musica Instrumentalis*.

At this point of our explanation it is possible to see that it is very difficult to find a uniquely and completely consistent interpretation of the *Timaeus* scale: as a cosmic symbol it can have multiple simultaneous interpretations, and this corresponds precisely to the richness of this Pythagorean style of expression (especially in musical symbolism, proper to *Musica Speculativa*). We think that Proclus is trying to include different possible interpretations in order to preserve that exegetical richness, at the expense of a coherence that more univocal modes

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[267] Adrastus of Aphrodisias, Peripatetic philosopher (II century). See Festugière, p. 215, note 1 *ad loc*. to his translation of this passage.

[268] This fragment of Adrastus is also quoted by Theon of Smyrna, *De util. mathem*. 63.25 ff. translated in Barker (1989), p. 220 ff. There are some differences between the two quotations.
For an explanation of Aristoxenus' set of *tropoi* or *tonoi* and its range, mentioned by Adrastus, see Barker's note 50, in p. 220. The ending of the quotation in Theon, that complements Adrastus' fragment in Proclus, adds more information concerning the significance of the range of Plato's diagram: "Plato has an eye to nature, since it is necessary that the soul, being constituted in accordance with *harmonia*, should advance as far as the solid numbers and be attuned through two means, so that it can pass through the whole of the complete, solid, cosmic body, and grasp all existing things; and hence he extended its *harmonia* to that point, even though in one way, and in respect of its own nature, *harmonia* is capable of extending without limit." (transl. Barker).

of expression have, like the Aristotelian, that does not accept the symbolic theory of the Harmony of the Spheres, and that depicts a soundless Universe.[269]

At the same time, although there can be different possible interpretations, there is a consistency behind the structure of cosmic scales; and the analogical similarities of the different scales (like those of Nicomachus, Ptolemy, Boethius, Plutarch, Plato, Timaeus Locrus, Proclus, etc.) cannot be ignored. The main problem in working out a musical scale for the *Timaeus*' progressions is that the numbers (1-2-3-4-8-9-27) present something like a blueprint that needs to be filled up. These numbers are octaves, fourths and fifths, etc., but the problem arises when we are confronted with the task of showing all the degrees of the scale; and different interpreters follow different divisions of the fourth (the interval in the ratio 4/3).

Another problem is to explain the symbolic meaning of these intervals, and how they can convey a metaphysical doctrine according to Proclus and the tradition that he is reporting. Having clarified the main problems the interpreter faces, the next step is to start studying the different ways of dividing the musical scale and the symbolic reasons for those divisions.

[269] The same can be applied to Proclus' acceptance, sometimes of the Platonic astronomical order, and other times of the Chaldean/Pythagorean (Ptolemaic too) arrangement. Cf. Siorvanes (1996), p. 304 ff. It depends on the cosmic symbolism, based on metaphysical reasons, more than observational, sensible criteria and its rationalisation in an abstract theory. For Proclus abstraction cannot be the source of real knowledge; only noetic, intellectual intuition is the real source of knowledge; and in this sense metaphysics is a higher discipline than the sciences. Of course the Aristotelians would complain about the Pythagorean/Platonic premise of the preeminence of Intellect, in music and astronomy, etc., over the senses.

Proclus' interpretation

As we mentioned before, Proclus says (*In Timaeum* II.170.2) that the Scale is composed of four octaves + one fifth + one tone.[270] If we add the ratios of these intervals (remembering that addition regarding intervals is multiplication), we can see that they add up to 27:

16 x 3/2 x 9/8 = 27

However, although Proclus prefers to follow an order of exposition of explaining the symbolism of the intervals, mentioning octaves, fifth and tone, we consider that the scale of the *Timaeus* is better understood as composed by 18 + 16 notes, with a fifth in the middle. We propose to reconstruct the structure of the scale following this interpretation because Proclus mentions in several passages of his commentary the cohesive character of the interval of fifth and identifies the pentad (principle of number 5) with the intermediate character of the Soul.[271] Proclus also mentions the importance of the number 34 and how it is composed symbolically by 16 + 18. Although he is mainly emphasising the fact that the scale is composed of 34 terms and illustrates the features of this number as containing the numbers that compose the ratio 18/16 of the diatonic tone, we suggest to consider these numbers for the division of the whole diagram, because these numbers are also symbolic of cosmic divisions also present in Proclus: the correlation between the Muses (9) and the Sirens (8), as we shall see below.[272]

Therefore, the logic of the scale is manifested if we divide 16 (in this case 16 is not the number of notes or terms, but the ratio that encompasses 4 octaves: 4 x 2/1 mentioned above) in two octaves on one side, and another two on the other side (each double octave would be represented with the ratio 4/1)[273]:

4 x 3/2 x 4 x 9/8 = 27

We have, in this way, two double octaves joined by a fifth as mediating interval plus a tone (see diagram 1 in p. 122). Our interpretation of the scale, centred round an intermediate interval of a fifth has the advantage of showing how the structure of the scale can portray Proclus' or other Neoplatonists' metaphysical

[270] Cf. also *In Timaeum* II.187.15; 207, 21 and 234, 7.
[271] On the symbolism of the interval of fifth see pp. 45 ff. above.
[272] Cf. *In Timaeum* II.188.9 ff; especially 188.29 – 189.2 and II.234.1: "the soul is composed from the second *epogdoos*: 18/16". See below, p. 136 ff.
[273] The ratio of the octave is 2/1, then two octaves is = 4/1 (2x2), four octaves = 16/1 (2x2x2), etc.

and symbolic conception of music, taking into account the proportions and the symbolism of the numbers mentioned in the previous page.

The first double octave can symbolize the *Tetraktys* that corresponds to the Intelligible (the main *Tetraktys* that is the Decad): this is the level of Paradigmatic harmony:[274]

1	2	3	4
e’’’	e’’	a’	e’
mi’’’	mi’’	la’	mi’

The fifth (3/2) in the middle position, between the numbers 6 and 4 (6/4 = 3/2), marks the passage from the archetypal level to the level proper to the World-Soul and the World contained paradigmatically in the World-Soul. Both these levels appear respectively represented in the following double octave, which contains a first octave (the *Tetraktys* of 36 = 35 + 1; explained in the previous chapter):

6	8	9	12
a	e	d	A
la	mi	re	LA

and a second octave that is the result of the duplication (octaves) of the previous numbers:

12	16	18	24
A	E	D	A,
LA	MI	RE	LA,

We only need one tone (9/8), to complete the scale, and this corresponds to the note G, (SOL,) and number 27. There is a tone (9/8) between the last number 27 and the previous number 24 (27/24 = 9/8); this is the last part of the Scale of the World-Soul that represents in turn the beginning of the sensible World. We have already seen that 27 is a cubic number (a solid number), which in a planetary scale of the Harmony of the Spheres could correspond to the Earth.

[274] We use the following convention (Helmholtz) for naming the different registers of the octaves: C_i – B_i (contra octave); C – B (great octave); c – b (small octave); c’ – b’ (one-line octave); c’’ – b’’ (two-line octave) and c’’’ – b’’’ (three-line octave); we add also the traditional latin notation for the *solfeggio*: Do, Re, Mi, Fa, Sol, La, Si.

It is interesting to note that the last part of the scale, the two octaves + one tone, consists of 15 notes + 1, similar to the extension mentioned by Proclus when he depicts Adrastus' view of the "modern" theoreticians, which corresponds to the famous *systema teleion* or perfect system of 15 notes plus one extra tone: the note called *proslambanomenos* that corresponds to the ratio of tone between number 24 and number 27.[275]

The last two lower octaves + one tone in the scale of the *Timaeus* correspond to 16 terms or notes; the rest of the scale that comprises the two higher octaves and the central fifth makes 18 notes. The reason for this division is also to show the analogy with the Universe. According to Proclus 16 being the double of 8 is related to the Sirens, that in the *Republic* correspond to the 8 spheres of the planets; then the last part of the *Timaeus* scale represents the sensible world and its principle of unification in the Soul.[276] The number 18 on the other hand is the double of 9 and is related to the Muses, the principles of the intelligible Harmony that circle around Apollo (represented in the Unity). Accordingly, the higher octaves of the scale represent the intelligible Harmony and the first note the Monad analogous to Apollo and the Intelligible Sun. There is an intermediate fifth (1536-2304) contained in this set of 18 notes. The fifth corresponds to number 6 (or the relation between 6 and 4), connected in Pythagoreanism with the nature of the Soul, showing in this way the circle of mediation of the Soul and the transition from the 384 - 1536 (e''' – e') octaves to the 2304 - 9216 (a – A,) octaves, which marks the passage from the Intelligible to the sensible. See Diagram 1:

[275] Cf the depiction of this system in Ptolemy, *Harmonics*, 2.4.1 ff. (50.10), especially the diagram in Barker's translation in (1989), p. 327. See also p. 117 note 268 above.
[276] Cf. *In Timaeum* II.234.1 ff. and II. 208.9; 210.24; 234.22. See p. 136 ff. below.

Diagram 1

	1	384	e'''	MI			
		432	d'''	RE			
		486	c'''	DO			
		512	b''	SI		T	Intelligible
		576	a''	LA		E	Harmony
		648	g''	SOL		T	
		729	f''	FA		R	*Noûs*
18 notes	**2**	768	e''	MI	4/1	A	
		864	d''	RE	*(two octaves)*	K	Paradigm
		972	c''	DO		T	of the
		1024	b'	SI		Y	Soul
	3	1152	a'	LA		S	
		1296	g'	SOL			Circle of
		1458	f'	FA			the Same
	4	1536	e'	MI			
		1728	d'	RE	3/2		
		1944	c'	DO	*(fifth)*		
		2048	b	SI	→ 2187 b♭ (SI♭)		
Middle	6	2304	a	LA			
		2592	g	SOL			
		2916	f	FA			
	8	3072	e	MI			Harmony
	9	3456	d	RE			of the
		3888	c	DO			Soul
		4096	B	SI →	4374 B♭ (SI♭)		
16 notes	12	4608	A	LA			Paradigm of
		5184	G	SOL	4/1		the Harmony
		5832	F	FA	*(two octaves)*		of the
	16	6144	E	MI			Spheres
	18	6912	D	RE			
		7776	C	DO			Circle of the
		8192	B,	SI →	8748 B,♭ (SI♭)		Other
	24	9216	A,	LA			
	27	10368	G,	SOL	9/8 *(tone)*		

This diagram can be considered a starting point for our reflection on the scale. There are several problematic issues, such as numbers 2187, 4096, 4374 and 8748. There are discrepancies in the different ways of interpreting the scale, which arise from considering it either a single linear diatonic series or a double series keeping the double and triple proportions on each side. We have preferred to show first the linear version because it shows better its cosmic significance as a symbol of the scale of reality. Nevertheless, we are going to deal with the problems that such a version of the scale presents.

We can recapitulate the main points of the explanation of the scale that can be checked against the diagram, and these are the following: the number 6 (a) is the middle of the scale (at the beginning of the second *Tetraktys* 6, 8, 9, 12); the scale has 34 terms and is divided in two parts of 18 and 16 terms respectively portraying the importance of the ratio of the tone 9/8 (9 x 2 = 18 and 8 x 2 = 16). Proclus studies all these correspondences between the numbers, musical notes, the whole scale and the Universe in the *In Timaeum* II.233.10 – 237.7. Instead of quoting the entire passage here, I will comment on selected sentences that are directly related to what I have just explained and because Proclus summarizes here many important points treated before.

Proclus begins this passage with:

> The whole psychogonic scale (*diagramma*) comprises 34 terms, or because of the *apotomê*, 36 terms.

Proclus mentions first his preferred interpretation of the scale as containing 34 terms, and secondly he mentions the possibility of these being 36, which was the interpretation of Timaeus of Locri[277] who included the interval of "*apotomê*" that is the difference between the tone and the semitone (or *leimma*).[278] I will treat this topic in detail because it is an important element to take into account if we want to reconstruct Proclus' interpretation of the scale of the *Timaeus*.

[277] We follow Proclus in calling the author Timaeus of Locri, but modern scholars consider the work to be a later production influenced by Plato's *Timaeus*. See Marg's German translation "*Timaeus Locrus*" (1972).

[278] *Apotome* (larger remnant), is the Pythagorean chromatic semitone, ratio = 2187/2048, which is the result of the difference between the "whole-tone" (ratio = 9/8) and the *leimma*, the Pythagorean or diatonic semitone (ratio = 256/243). Cf. Barker (1989), p. 38 note 36 and notes 187 above and 291 below.

We are going to study the numbers that we have used in this diagram that start with 384 as the first term. They are used by Timaeus of Locri, who in his sequence made of 36 terms adds two numbers: 2187 and 6561, (which express two *apotomai* 2187/2048 and 6561/6144 (and also includes 4374 and 8748); consequently Timaeus' scale has as the total addition of all terms = 114,695. Proclus has 4374 and 8748 both B♭ (SI♭), instead of 4096 and 8192 (and leaves out 2187); total addition = 105,947.[279] A.E.Taylor's total addition, in his *Commentary*, does not include the numbers added by Timaeus or the B♭ accepted by both Proclus and Timaeus, therefore it equals 105,113.[280] The numbers that we have used aligned here in diagram 1 (p. 122) contain 4096 and 8182, following A.E.Taylor's interpretation, which are not included by Proclus.[281] Proclus' inclusion of 4374 and 8748 instead of 4096 and 8192 should be explained in musical terms, according to a scale which is in the diatonic genus. The two upper octaves of the scale are structured in the same way that most harmonic theorists treated the paradigmatic octaves, each having the structure:

tetrachord – tone – tetrachord.

Several problematic numbers appear in the two lower octaves and in the transitional fifth. If the total addition of the numbers in Proclus is 105,947, then he left out 2187 and 4096 (and its double 8192). We can ask why did he mentioned these numbers when presenting the structure of the scale and why did he include 4374 and 8748, terms generated by 2187 (in double proportion). Is it due to an influence of Timaeus of Locri or to the need to show the proportional structure of both the double and triple harmonic progressions? Another important question is —if Proclus included 2187— why he used the *apotomê*, which he has criticized as an interval not used by Plato. The musical explanation of the inclusion of 4374

[279] Proclus says that the sum of the 34 numbers in the *Timaeus* sequence is 105,947 at II.236.9. See below p. 128. Cf. Baltzly's translation of Proclus (2009), note *ad loc*. to II.170.31 on Timaeus of Locri and the numbers 384 etc.
[280] Cf. A.E. Taylor (1928), p. 144.
[281] Festugière's translation has a mistake on p. 238, it is not 6776 (at *In Timaeum* II.191.20-25); and Marg's German translation of "Timaeus Locrus" (1972) has a mistake on p.72; it says 2306 but it should be 2304. Cousin's translation of Plato's *Timaeus*, which contains also Timaeus Locrus, uses this latter author's version of the numbers (Platon, *Oeuvre* Vol.12). Cf. Baltzly's translation of Proclus (2009), p.159 note 287.

and 8748 is that they are needed to create and mirror the same structure of the two upper octaves: tetrachord — tone —tetrachord, where each tetrachord has a *leimma* at the bottom. Therefore, Proclus left out 4096 and 8192, but included 4374 and 8748 due to the harmonic proportions of the triple progression. The result is a scale composed of 24 tones and 9 *leimmata* (Pythagorean semitone) = 34 terms (*In Timaeum* II.187.13).[282] In order to study the harmonic relation between Proclus' numbers, we need to study Timaeus of Locri's possible influence in Proclus.

Since the numbers starting in 384 were preferred to represent the scale of the *Timaeus*, following a long tradition, it is necessary to explain where these numbers come from; for this reason we need to explain the relation between the numbers that express the tone, the *leimma* and the *apotomê*.

Proclus has already discussed this topic in *In Timaeum* II. 188.9 ff. There he points out that since Timaeus of Locri takes as extreme terms (endpoints of the scale) the same numbers as Plato (384 and 10368) if he wants a scale of 36 terms, then he had to insert another two terms to the scale. Timaeus starts from the idea that number 36 is a divine number. Therefore, the total number of the notes should correspond to 36. Nevertheless he wants to keep the same extremes (384 and 10368). For this reason he needs to add two numbers in the middle of the scale (because Plato's scale has 34, and it is necessary to have 36). These two numbers result in the ratio of the "*apotomê*" in relation to numbers already contained in the progression. Proclus does not accept the additional numbers because he says that Plato does not mention the interval of "*apotomê*".

At this point in the explanation Proclus has already mentioned the numbers starting from 384 as the best numbers for showing the ratios of the intervals of the scale of the *Timaeus*, in a clearer way and without needing fractions. Proclus is following Adrastus, among other sources, in his analysis of the scale of the *Timaeus*. Adrastus says, in the long fragment of his book preserved in Theon of Smyrna, that the ratio of the tone was found as the difference between a fifth and a fourth 3/2 ÷ 4/3 = 9/8 (*De util. math.* 66.12 ff.).[283] After this, the theoreticians

[282] Baltzly's note 287 on p. 159 to his translation suggests that Proclus left out 2187 and 4096. However, Haar considers that although 2187 has no place in the double progression, it is still needed in the triple progression (4374 and 8748 as well); see Haar's interpretation of Proclus' scale in Haar (1960) pp. 21 ff. In the triple progression, 2187/2304, 4374/4608 and 8748/9216 are not *apotomai*; they are *leimmata*, as we shall explain below (see pp. 128 ff. and diagram 2).
[283] Cf. p. 117, note 268 above.

needed to deal with the internal composition of the fourth and Adrastus informs us that although the more ancient authors did not investigate this problem, there were later different theoreticians that examined the question and although everybody agrees that the fourth is "greater than a ditone but smaller than a tritone",[284] they disagreed on how the tone had to be divided (semitone, *diesis*, *leimma*, etc.).[285] Aristoxenus for example, said that the fourth consists exactly of two and a half complete tones,[286] but Plato said that it consists of two tones of 9/8 and a remaining part, called by Plato in the *Timaeus* "*leimma*", which is in the ratio 256/243, because:

4/3 = 9/8 x 9/8 x 256/243.

Adrastus then (68.3) studies these ratios taking the numbers 192, 216, 243, 256 as the epitritic fourth (4/3) containing two epogdoic (9/8) tones and a *leimma* (precisely between 256 and 243).[287]After this, he mentions some theoreticians that take 384 as the first term, because "they multiply the first term, 6, by 8, making 48, and take this again eight times, making 384 whose epitritic is 512."[288]

It would have been easy to say that these numbers are the double of the previous ones, but we think that Adrastus has in mind a whole tradition in interpreting the *Timaeus* scale, and for this reason he says that 6 is the first term (*ton prôton horon*) and finds 384 starting from it, because some interpreters had first multiplied by 6 the numbers of the *Timaeus* and started with 6 as the first portion or term (1), as Proclus shows in *In Timaeum* II.175.28 ff.

We have seen the importance of number 6 in the study of musical intervals (in the progression 6, 8, 9, 12) and also it evoked symbolic analogies with the nature of the Soul. Proclus mentions this as a reason why Timaeus of Locri preferred 36 terms rather than 34.

Other interpreters, however, started the progression with 384, because, as Adrastus says, these numbers serve to explain the constitution of the fourth and exempt us from fractions.

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[284] Cf. Barker (1989), p. 222 and specially note 55 where he explains that Adrastus probably meant that the earliest Pythagoreans did not study the composition of the tone, but Philolaus and Archytas were most likely the first to assign mathematical ratios to intervals smaller than the tone.

[285] For Philolaus *diesis* is equivalent to *leimma*, and it is not exactly half a tone (semitone), but the smaller part of the tone in the ratio 256/243. The *apotomê* is the larger remnant, and the difference between them a *komma*. See notes 187 above and 291 below.

[286] Cf. Barker (1989), p. 417.

[287] See the diagrams in Barker (1989), p. 223. Adrastus explains that the numbers that he studies here come from multiples of 9 and 8 the ratio of the tone, i.e. 64 ; 72 and 81, because 64 x 3 = 192; 72 x 3 = 216 and 81 x 3 = 243 and the epitritic of 192, which is 256 .

[288] Transl. Barker, *ibid*.

Plutarch, who also gives these reasons among others, is the more reliable author concerning the choice of 384 and the origin of this interpretation of the scale. Plutarch says that Eudorus, following Crantor, took as the first of the numbers 384, which is the product of six multiplied by 64 and that they were attracted to this number because it has 72 as sesquioctavan.[289]

Proclus brings in these numbers in the explanation in *In Timaeum* II.177.25, precisely after treating of the ratio 256/243 in the context of the interval of fourth between 192 and 256, like Adrastus. Since in the octave contained in the ratio between 192 and 384 it is not possible to find an integer number between 324 and 384 (in the ratio 9/8 with 324), Proclus says that it is necessary to double the numbers and start from 384 that corresponds to the first term (1) in Plato's progression, until 10,368, corresponding to 27 (10368/384 = 27). After this, in a long and complicated section (II.177.25 – II.193.7), Proclus deals with the problem of the semitone and different solutions for the division of the tone and investigates the problem of the *apotomê* and the *komma* and how this affects the total number of terms contained in the scale (34, 36, etc).

Proclus says (II.188.25 ff.) that Plato does not mention the *apotomê* and because the scale is in the diatonic genus, it should contain tetrachords or fourths composed of two tones (9/8) and one *leimma* (256/243). For this reason the scale consists of 34 terms only (containing 24 tones and 9 *leimmata*, cf. II.187, 13). However, Proclus, according to the nature of his commentary, needs to include as many interpretations of the *Timaeus* as possible in order to study the text in all its possibilities and richness. Accordingly he explains Timaeus of Locri's diagram as well.

Timaeus of Locri divided the tone in a *leimma* (the Pythagorean "diatonic semitone"[290]) and an *apotomê*. He introduced the numbers starting from 384 and showed that between 2048 and 2187 there is an *apotomê*.[291]

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[289] Plutarch (*De an. procr*. 1020 C-D) also mentions the option of multiplying the numbers of Plato by 6 and gives an explanation of Plato's treatment of the *leimma* based on the tetrachord starting in number 192, that includes 256, 243, as more typically Platonic. The preference of 384 (and the *leimma* 512/486 doubles of the previously mentioned numbers) appears to be related to the school of Xenocrates and particularly to Crantor and Eudorus. Cf. Cherniss' translation of Plutarch, p. 170 note c.

[290] See note 187 above.

[291] Barker (1989), p.38 n. 36, explains that Boethius, *Inst. Mus.* 3.5 (DK. 44 A26, translated in Burkert (1972), p. 395) says that "Philolaus called this smaller part of the tone *diesis*, the larger remnant *apotomê*, and the difference between them *komma*." The *diesis* corresponds to Plato's *leimma* (256/243) and the *komma* is mentioned by Proclus (*In Timaeum* II.183.30 ff.) as being in the ratio 531.441/524.288. Cf. also West (1992), p. 235.

1944 2048 2187

Leimma	*Apotomê*
256/243	2187/2048
Tone = 9/8	

256/243 x 2187/2048 = 9/8

These numbers appear inside the transitional fifth of our interpretation of Proclus' scale; between 1536 and 2304.

This gives two possibilities, b natural or b flat, for the fourth starting in 1536 (that corresponds to number 4 in Plato's progression):

1536	1728	1944	2048	2187	2304
e	d	c	b	b-flat	a
(mi	re	do	si	si bemol	la)

The fifth should have the structure of a fourth plus a "disjunctive" tone: we can use 2048, as Proclus probably did, both because of the total amount mentioned by him (the addition of the 34 terms of the scale is 105,947; cf. *In Timaeum* II. 236.9) and also because 2048 is a very important number in the double progression, as the harmonic mean between 1536 and 3072. If we use 2048, then the "disjunctive" tone of the fifth should be between 2304 and 2048; if we use 2187 instead of 2048, the tone is between 1728 and 1536 to preserve the structure of the tetrachords (tone-tone-*leimma*).

If we consider the fourth between 1728 and 2304, this can be understood as a diatonic tetrachord: d, c, b-flat, a. If we also include the b natural it could be interpreted as being part of an alternative structure: d, b, b-flat, a (a chromatic tetrachord composed of tone+*leimma*, apotome, *leimma*. Otherwise, if we leave out 2187 then 2304/2048 can be considered the "disjunctive" tone and 3072/2304 the diatonic tetrachord.

Since Proclus does not accept the *apotomê* for his diagram, we can consider leaving out 2187. Another reason is that the already mentioned total addition of

the 34 numbers cannot include it. Baltzly proposes in his translation to excise this number from II. 186.14-15.[292]

However, Proclus included 4374 and 8748.[293] These numbers do not completely match with the others in the double progression, in terms of the ratios of the intervals, because for example 4374 is not in the ratio 4/3 with 3072 (3072 is the 8th term in Plato's sequence, since 3072/384 = 8). On the other hand, 4374 and 8748, although they do not produce a fourth with 3072 or 6144, they serve the purpose of creating tetrachords with the *leimma* in the lower part, which mirrors the structure of the first two upper octaves, as we mentioned above.

4096 and 8192 fulfil the relations in terms of the double progression but they do not create the structure of the tetrachords. Nevertheless, A.E.Taylor in his commentary on the *Timaeus* prefers 4096 and 8192 and makes the total addition of the scale 105,113. Proclus' commitment to a rich exegesis of the text could have influenced him to include all possible numbers, in order to retain the coherence with Timaeus of Locri's version and presenting alternative structures in the main text.

If we want to make a single scale putting together the double and the triple progression, the best option to combine both sequences is to include 2048 instead of 2187 and 4373 and 8748 instead 4096 and 8192.

In order to show the difference between the linear diagram and the way of working out the proportions for both progressions, consistent with the *lambda* scheme, we can present the diagram of the harmonic and arithmetic means with the sequence of numbers that we are studying:

[292] For another reason for preferring 2048 to 2187 see p. 142 below (cf. also p.128).

[293] It seems that Proclus gives preference to the numbers that add up to 9 when all the components are added together for cyclical symbolic reasons: for example 4374 is 4+3+7+4 = 18, which in turn is 1+8 = 9. The same can be said of 8748, that is = 27; 2+7 = 9. But on the other hand, the other possible terms — 4096 and 8192 — do not give this result.

384

HM 512

AM 576 HM 576

768 AM 768

HM 1024

AM 1152 **1152**

1536

HM 1728

HM 2048

AM 2304 AM 2304

3072

3456

HM 5184

AM 6912

10368

The structure that appears in this diagram is the blueprint for filling up the intervals of fourths and fifths (and the tones and *leimmata* that compose them), keeping the proportions in both sides, as Proclus explains.[294] Proclus depicts the completion of the scale in *In Timaeum* II.185.2-187.15. We represent his depiction of the harmonic proportions between the terms, in both the double and triple series in a diagram in two columns (it can be done also in the form of *lambda*), to show the different roles that numbers 2048, 2187, 4096, 4374, 8192 and 8748, play in the structure of the double and the triple progression. The triple progression, on the right side of diagram 2, is structured as a group of octaves+fifth and at the same time as octaves composed by tetrachord-tone-tetrachord:[295]

[294] Proclus says that Adrastus arranged the whole scale (with all the 34 terms) in a *lambda* scheme and in three nested triangles (*In Timaeum* II.187.15 ff.).
[295] Cf. diagram 1 on p. 122.

Diagram 2:

	(1)		T	384		e'''	MI		384	T		(1)
			T	432		d'''	RE		432	T		
			L	486		c'''	DO		486	L		
2/1	4/3	HM	T	512		b''	SI	2/1	512	T		
	3/2	AM	T	576		a''	LA		576	T	HM	3/2
			T	648		g''	SOL		648	T		3/1
			L	729		f''	FA		729	L		
	(2)		T	768		e''	MI		768	T	AM	(2)
			T	864		d''	RE		864	T		
			L	972		c''	DO		972	L		
2/1	8/3	HM	T	1024		b'	SI	2/1	1024	T		
	(3)	AM	T	1152		a'	LA		1152	T		(3)
			T	1296		g'	SOL		1296	T		
			L	1458		f'	FA		1458	L		
	(4)		T	1536		e'	MI		1536	T		
			T	1728		d'	RE		1728	T	HM	9/2
			L	1944	3/2	c'	DO	3/2	1944	T		3/1
2/1	16/3	HM	T	2048		b b♭	SI SI♭		2187	L		
	6	AM	T	2304		a	LA		2304	T	AM	6
			T	2592		g	SOL		2592	T		
			L	2916		f	FA		2916	L		
	(8)			3072		e	MI		3072	T		
						d	RE	2/1	3456	T		(9)
						c	DO		3888	T		
				(4096)*		B B♭	SI SI♭		4374	L		
						A	LA		4608	T		
						G	SOL		5184	T	HM	27/2
						F	FA		5832	L		3/1
						E	MI		6144	T		
						D	RE	2/1	6912	T	AM	18
						C	DO		7776	T		
				(8192)*		B, B,♭	SI SI♭		8748	L		
						A,	LA		9216	T		
						G,	SOL	9/8	10368			(27)

* Not included in Proclus, they are doubles of 2048. T = tone (9/8); L = *leimma* (256/243).

This diagram, done according to Proclus' depiction of the proportions, is an exercise in the science of harmonics and also in dialectics, because the numbers and the harmonic and arithmetic means show the divisions not only of the musical scale but of reality. It shows that reality is not divided anywhere; there are points that mark the divisions and those are marked in the diagram with the different kinds of brackets (brace). There are mainly two sides in the diagram, the left for the double progression and the right for the triple. There are some numbers that have a role in one of the progressions but not in the other (e.g. 2048 and 2187, etc.) because they mark different divisions, tones, *leimmata*, in the corresponding tetrachords or fourths in which they are present. Both sides are made of octaves composed of tetrachord-tone-tetrachord; the tetrachords are composed of tones and *leimmata* (there are no *apotomai* in either progression). According to Proclus, the complete scale is made of 9 *leimmata* and 24 tones. The terms should be 34, if we want to make a linear scale; however if we want to take into account the differences between the double and the triple harmonic proportions, then we could have interchangeable numbers, such as 2048 and 2187. Proclus presents all the possibilities, and for that reason it could seem that he is introducing terms used by Timaeus of Locri and others that do not correspond to the diatonic scale. But in fact both progressions are in the diatonic genus, made of tetrachord composed of tones and *leimmata*. If we count all the numbers then the total addition would be more than the number mentioned by Proclus (105,947), but this could be due to the need to leave some of them out, such as 2187 and 4096, in order to make a single linear scale. But Proclus mentions all numbers when working out the proportions, because they are needed for marking the harmonic divisions of the World-Soul.

There are two options; one is to keep the scale diatonic all through, following the double progression until 1536 (from the top down) and from there on, to include 2048, 4373 and 8748 (the only change happens within the transitional fifth: which is structured T/TTL instead of TTL/T). The other option is to study the doubles and triples independently and apply the diatonic tetrachords to both progressions, showing all possibilities. In our first diagram (p.122) we preferred the first option, following the version of A.E.Taylor, which presents a continuous diatonic scale, based on the double progression, including 4096 and 8192 and leaving out 2187, 4374 and 8748 (all B♭). In this second diagram we preferred the

second option, explaining the triple progression in more detail, following Proclus' completion of the scale, in order to show why there seem to be several discrepancies in the text, which appear after working out the diagram as part of the explanation and not inconsistencies at all. We followed Haar (1960), p. 28, Baltzly's translation and Barker's advice for this explanation of Proclus' scale and diagram.[296]

This exegesis of the scale is tied to the origin of the application of the numbers starting from 384 to the scale of the *Timaeus*. Adrastus does not mention who were the theoreticians that used 384 etc.; all that we can know is that they were his predecessors. Severus used the numbers starting from 768, and he seems to be doubling the original progression. The progression that starts from 384 was used by the first commentators of the *Timaeus* (Crantor, Eudorus, etc. according to Plutarch, *De an. procr.* 1020 C-D) and also appears in Timaeus of Locri's book. The choice of these numbers is not only based on practical reasons. Although they were used to explain the composition of the fourth and the *apotomê*, they have, once they are inserted in the cosmological diagram of the *Timaeus* a symbolic and metaphysical meaning (as we shall see), that transcends practicality, a characteristic that after all is in consonance with the exigencies of Pythagorean and Platonic music; i.e. to go beyond the sensible and express the cosmic and the Intelligible through its mathematical foundations. Between terms 6 and 9 there is an intermediate fifth, which can represent the intermediate character of the World-Soul, as we mentioned before.

Compare the following diagram of Zarlino's *Le Institutioni Harmoniche*, 104 (Venice, 1558). Zarlino's diagram corresponds to the two lower octaves + the transitional fifth of our diagram 2 and includes all possible numbers (both bs and b-flats) with the same numbers used by Proclus (from 1536 to 10368):

[296] Another way of explaining the doubles and triples is Severus' version of the scale, which starts with 768 as the first term. Proclus depicts this system in II.191, after presenting Timaeus of Locri's scale. I am grateful to Peter Blumson who discussed with me the different interpretations of the text by correspondence. Blumson recommends following Severus to better understand the triple progression.

Diagram 3:

Zarlino, Le istitutioni harmoniche, 104

INTRODVTTORIO DI GVIDONE ARE-
tino ordinato se- condo le diuisioni
Pithagorice nel genere
Diato- nico.

	1536	ee							la	tuono
	1728	dd						la	sol	tuono
	1944	cc						sol	fa	se.mi.
	2048	♭♭							mi	se. ma.
	2187	bb						fa		b. mi.
Nete hyperbol.	2304	aa					la	mi	re	tuono
Paranete hyp.	2592	g					sol	re	ut	tuono
Trite hypbol.	2916	f					fa	ut		se. mi.
Nete diezeug.	3072	e				la	mi			tuono.
Paranete dic.	3456	d			la	sol	re			tuono
Trite diezeu.	3888	c			sol	fa	ut			se. mi.
Pare mese.	4096	♮				mi				se. ma.
Tuono.	4374	b			fa					se. mi.
Mese.	4608	a		la	mi	re				tuono.
Lycha. mes.	5184	G		sol	re	ut				tuono.
Parhyp. mes.	5832	F		fa	ut					se.mi.
Hypate mes.	6144	E	la	mi						tuono.
Lycha. hyp.	6912	D	sol	re						tuono.
Parhy. hypa.	7776	C	fa	ut						se.mi.
Hypate hypat.	8192	♮	mi							tuono.
Proslibanomen.	9216	A	re							tuono.
	10368	Γ	ut							

Nete hyperbol.
Paranete hyp.
Trite hypbol.
Tetr. Hypbo.
Nete diezeug.
Paranete dic.
Trite diezeu.
Tetr. diezeug.
Nete syneu.
Paraner. syne.
Tuono.
Trite syne ne-
Mese.
Tetra. syneu.
Lycha. mes.
Parhyp. mes.
Hypate mes.
Tetr. meson.
Lycha. hyp.
Parhy. hypa.
Hypate hypat.
Tetr. hypaton.

The choice of 34 terms and the relation between levels of the universe and levels of the musical scale

Proclus presents several arithmological reasons that can support the choice of 36 or 34 terms in his *In Timaeum*. II.233.10 ff. We have already seen that 36 is an important number for the musical *tetraktys*. Proclus says that 36 derives from the hexad when it comes back over itself and that has been consecrated to the Soul because 6 is the first even-odd number[297] and the Soul is analogously placed between the Indivisible and the divisible realities (represented respectively with the odd and the even).[298] Proclus says also that the hexad is related to the Soul because it is a cyclic number (when it is squared it comes back to itself). Next (II.233.17), he continues comparing the cyclical character of the hexad with that of the pempad (another name of the pentad or the qualitative principle of number 5), and states that the difference is that the hexad is cyclic as male and an image of the circle of the Intellect, and the pempad is female and an image of the circle of the Soul. Both numbers were in the arithmological Pythagorean tradition symbols of marriage and the union of male and female (3 x 2 or 3 + 2). It is interesting to note that here the hexad is considered male although it is an even number, while the pempad is considered by Proclus female, and it is an odd number; the contrary would have been expected according to Pythagorean ideas. This interchange of characteristics is proper, in traditional analogical theories like Pythagorean arithmology, to a representation of the interaction of complementary principles.

In this context the cycle of the pempad (identified with the Soul), which in music corresponds to the circle of fifths (intervals of 3/2) appears as included in the frame of the circle of the hexad (identified with the circle of *Nous*) and with number 36 as the total number.

On the other hand, the number 34 also has important symbolic correspondences with the Soul and the Cosmos. Proclus says that the number 34 is "an image of the Soul when it multiplies itself starting from itself with its own generative

[297] Six is the result of 2 x 3, the first even and odd numbers; in this sense six is the first number that is a combination of even-odd and male-female. As Proclus says later, five has a similar quality, but in relation to addition (2 + 3) not to multiplication. They both mirror at the level of number, in the manner of unification, the previous Unity of the complementary pair of peras-apeiron, odd-even, male-female, etc. present in the Monad. The One as even-odd is not a number; it is the principle of number. Cf. Festugière (1954a), p.6 ff. and Chapter 2 *passim*.

[298] Cf. also [Iamblichus?] *Theologoumena Arithmeticae* (45 ff.), section on the Hexad, about the relation between this number, the Soul and music. In this section it is also mentioned that 1+8+27 = 36, that are important numbers in the *Timaeus* progression and also that 6, 8, 9, 12 and the monad add up to 36 as we have seen in the previous chapter.

power".[299] Proclus shows the relation between the Soul and the dyad and the Tetrad and how number 34 is produced as

$2 \times 4^2 + 2 = 2 \times 16 + 2$.[300]

Proclus continues presenting another correspondence between the nature of the Soul and number 34; in this case it is because 34 can be analysed as 18 + 16. The diagram is constituted in the diatonic genus,[301] in which the epogdoic ratio (or sesquioctave 9/8) is the constitutive interval of the fourth (2 x 9/8 and a *leimma* of 256/243). The interval 18/16 is, Proclus says in II. 234. 5,[302] the *second* epogdoic (the first is 9/8, and 18/16 is the double), and shows the correspondence of the Soul with the *secondary* reality, as coming after the *Nous*.

Proclus presents another analogy (*In Timaeum*. II.234.1) and this is that 18/16 corresponds to the *paramesê* which is the string (or the name of the note) which in the Lyre makes an interval of tone (9/8) with the *mesê* or middle note, a characteristic that is appropriate to the intermediate nature of the Soul. If we have in mind that it is possible to represent the Harmony of the Spheres in this octave, the notes in the extremes represent the Heaven and the Earth (or the Moon, depending on the sources). The Soul in the Middle is represented with the position of the Sun (*mesê* or *paramesê*), having the intermediate place between the Intelligible and the material world in an analogous manner with the Sun being in the middle of the spheres in the Pythagorean and Chaldean tradition.[303]

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[299] *In Timaeum* II.233.26.

[300] According to Charles Mugler's explanation in Festugière's translation, note 5, in p. 279, Vol. III. Proclus has identified the Soul as middle term in a progression 1: Nous, 10: World, and 4: Soul. He says that the side of the square, which is a dyad, is twice squared and again we add the side (2) so that we have 34 as a result.

[301] Proclus has a similar explanation in II.188.30, where he reminds the reader that the diatonic genus only admits the ratio of tone (and not a division of it) and the *leimma* of 256/243 wich is not an exact division but the remaining interval besides the two tones needed to conform the fourth of 4/3. The other genera in Ancient Greek Music theory, the chromatic and the enharmonic, include different divisions of the tetrachord and the tones that compose it. Cf. Proclus, II.168.14 ff. and Barker (1989), p. 216, note 26.

[302] Cf. II.189.5 for a parallel depiction of the Soul as second nature in relation to the ratio of 9/8 between 18/16.

[303] In Theon and Proclus the Sun represents the Heart of the World (see note 163 above), and in this sense it is more appropriately another presence of the Nous in the middle of the Soul (the Nous has a supra-rational and non-discursive quality represented in the central point of the circle, which is the astrological symbol of the Sun), and this is probably why Proclus says that the *paramesê* corresponds to the Soul and not exacly the *mesê*: showing in the interval between *mesê* and *paramesê* the relation between the Soul and the presence of the Nous *within* the Soul. Plato himself uses the word *mesê* in the *Timaeus* when he says that the Demiurge bends the Soul in the

We have the testimony of Ptolemy that shows not only the identification *paramesê* = Sun in *Harmonics* III.16 (111),[304] but what is more remarkable is that in the Canopus inscription ascribed also to Ptolemy,[305] an identical scheme of the spheres of the world is depicted but this time with numbers on the side, and 18 and 16 are precisely the numbers attributed to the interval between the *paramesê* and the *mesê* that correspond to the spheres of the Sun = 18 and Venus and Mercury = 16.[306] Proclus follows then the same scheme when he says that the Soul associated with number 34 as 18 + 16 is identified with the second epogdoic interval 18/16 that corresponds to the note *paramesê*. The only difference is that in the astronomical version the Sun corresponds to that note, and in Proclus' metaphysical account it is the Soul that corresponds to it, but this is appropriate due to the analogical relation Sun/World Soul.[307]

The symbolism of 18/16 as double of 9/8 showing a more secondary level in the procession can be related to an account that Proclus gives of the spheres of the world in *In Remp*. II. 238, 23, distinguishing celestial Sirens from Sirens attached to *genesis*. He refers to a Chaldean theory (*Or. Ch*.22.3) saying that the Theologians multiply by two the celestial zones, when alluding to the sublunar region (having then 1 + 7 = celestial Sirens and 2 + 14 = terrestrial Sirens; the Muses (9 in number) lead over all the different classes of Sirens, giving an "intellecual harmony (*noera harmonia*)", while the Sirens produce a bodily concord (*harmonia somatoeidês*). If we add all these numbers, taking into account also Apollo, we have 34 terms:

Apollo = 1 + Muses = 9 + Celestial Sirens = 8 + terrestrial Sirens = 16 = 34.

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middle; since he has presented the harmonic mix of the Soul the musical meaning of the word can be evoked, and it does not mean only a determination of the space.

[304] Cf. Barker (1989), p.390-391, the diagram in note 90. Cf. also Nicomachus, *Ench*.ch 3 (text 10 in Barker) and Aristides Quintilianus, *De Mus*. Book III, ch. 22 (text 12 in Barker).

[305] Cf. Barker *ibid.*, p. 390 note 89; Inscription included in the Teubner edition of Ptolemy's works, ed. J.L. Heiberg, Leipzig, 1898-1907. There is a provisional translation as "Ptolemy's Canobic Inscription" by Alexander Jones in http://www.chass.utoronto.ca/~ajones/ptolgeog/astroworks.html.

[306] The correspondence between Mercury and 16 can show also the usual association between number 4 and Hermes, as in the case of the Lyre of four strings, etc. For this reason the number 16 (4 x 4) can be appropriated for Mercury, who corresponds to the awakening of the presence of the divine logos within the Soul, as we shall see in the next chapter.

[307] The symbolism of 18/16 as double of 9/8 showing a more secondary level in the procession can be related to an account that Proclus gives of the spheres of the world in *In Remp*. II. 238, 23, distinguishing celestial Sirens from Sirens attached to *genesis*. He refers to a Chaldean theory (*Or. Ch*.22.3) saying that the Theologians multiply by two the celestial zones, when alluding to the sublunar region (having then 1 + 7 = celestial Sirens and 2 + 14 = terrestrial Sirens; the Muses lead over all the different classes of Sirens, giving an "intellecual harmony (*noera harmonia*)", while the Sirens produce a bodily concord (*harmonia somatoeidês*).

Proclus has a similar description of the metaphysical levels represented as musical intervals in his *Commentary on the Republic* II.4.5 ff., and this time the *mesê* corresponds to the Soul:

> The Musagetes fills the Universe with a divine Harmony that makes it a unitary cosmos and harmonizes everything with three terms (*horoi*): the Intellect as a *hypatê*, the Soul as a *mesê* and the Body as a *nêtê*; and that makes the whole perfect as a true demiurgical Lyre, and he alone has the power.[308] The Muses, on the other hand, are a manifold originated in the Musagetes, that having proceeded from the Monad of this god until the complete number (*ton holon arithmon* = 9?), longs for being a new unity (*hen neon*).

In this analogical representation the similarity with the *Timaeus* is that there are three musical/metaphysical levels: Intellect/*hypatê*, Soul/*mesê* and Body/*nêtê*, with the Soul in the middle of the system. But the main difference is that the pitch of the sounds is inverted and the highest level (Intellect) here gives the lowest note (*hypatê*); one reason for this could be that the word used for the name of the string "*hypatê*" means originally "highest".[309]

In his explanation of the *Timaeus* scale, Proclus follows Adrastus and other Middle Platonists in their use of the numbers of the *Timaeus* starting from 384. Proclus also follows them in interpreting the greater numbers as lower sounds, and hence the solid realities or bodies as corresponding to lower notes in the scale. But in the system depicted in the *In Remp*., Proclus seems to follow Nicomachus in his depiction of higher spheres as giving the lower sounds and with the Sun as the *mesê*. Since Proclus is commenting on the *Republic* 443d, he also follows Xenocrates' interpretation of this passage. As Barker mentions, explaining possible reasons for changing the association with the order of the notes, Xenocrates "distinguished a Zeus *hypatos* (a 'higher' Zeus) who rules in the region of eternal self-sameness, and a Zeus *neatos*, whose province is the world of change below the moon."[310] Consequently, there could be an intermediate Zeus *mesos* that corresponds to the World Soul, as in Proclus' scheme. The context of Xenocrates' quotation in Plutarch is also a commentary on *Republic* 443d where Plato says that the three parts of the soul must be harmonized like the three terms

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[308] Proclus uses the word *kratos* that according to Liddell-Scott is also a Pythagorean name for the Decad (*Theol.Ar*. 59). This association is probably implied in this case, because Apollo together with the Muses represents ten. There is also the possibility that Apollo's ordering power is evoked in the association because he mantains the order of the cosmos which was represented with the Decad as well.

[309] Cf. Barker (1989), p. 251, note 20. There are different traditions about the pitch of sounds in the Harmony of the Spheres and also about the actual correspondence between numbers and notes (or strings of the Lyre).

[310] Plutarch, *Quaest. Plat*. IX. I, quoted by Barker (1989), in p. 252, note 20. Cf. Dillon (2003), p. 132.

of musical harmony: "*neatê*, *hupatê*, and *mesê*". It is also important to notice that there were three Muses known with the three names of the strings mentioned.

On the other hand, it is not clear if Proclus is talking about astronomical spheres in this text (*In Remp*. II.4.5 ff.). Many authors consider the ascent through the musical scale as a symbol of the ascent through the spheres of the world up to a *hyperouranios topos* (Plato, *Phaedrus* 246e ff.) beyond the sphere of the Heaven identified with highest pitch. It is reasonable then, to think that the ascent would continue through the hypercosmic levels of the Neoplatonic hierarchy. At the same time, one explanation of this inconsistency in pitch could be that because of the inverted nature of the analogy, there could be a change in the direction, due to symbolic reasons, because the sensible World reflects the Intelligible World as in a mirror (and we know that Plotinus and Proclus, following Orphic sources, called the sphere of the Heaven the mirror of Dionysos, that reflects the hypercosmic region as a lake reflects the surrounding surface).[311]

Although we are mainly explaining Proclus' symbolic reasons for choosing 34 as the number of terms in the scale of the *Timaeus*, we consider it important to digress here about the scale of the planetary spheres, because if the scale of the *Timaeus* has to contain an image of the whole of reality in its 34 terms, we need to consider the relations between the metaphysical levels and the cosmic spheres. Up to this point we have seen that Proclus mentioned three levels: Intelligible, World-Soul and Body of the World (that contains the spheres of the planets). The Soul corresponds to the second level, and this is represented with the second epogdoic ratio which is 18/16 (cf. *In Timaeum* II.234.1 and II.189.1 ff.); this ratio of the tone is also the interval between the *mesê* and the *paramesê* (attributed to the Sun by Nicomachus and Ptolemy respectively). We have seen also that Proclus in one version associated the Soul with *paramesê* (*Timaeus*) and in another with *mesê* (*Republic*). Proclus identifies the Soul with the *mesê* in the context of the *Republic* mentioned above, where Plato himself presents the three parts of the Soul, as a harmony of three main intervals, lowest, highest and mean; it is well-known that in Platonism this triadic division is mirrored in the society as a whole as well as in

[311] The symbol of the Universal Tree that raises its top from Earth to the Heaven, when is considered as having its roots in the Heaven is seen as the inverted reflection in a lake (as Plato says about the human soul being a celestial Tree with the roots in the Heaven). Cf. A.K. Coomaraswamy, "The Inverted Tree", in (1977a) p. 376. Cf. also Dante, *Divina Commedia*, *Paradiso* XXVII, 118 and Pépin (1970), on the Orphic sources of Plotinus' image of the mirror.

the cosmos. This shows that although the Soul has the three levels in itself, its position in the middle of the Intelligible and the sensible makes it the paradigm of mediation where the more proper nature of the soul corresponds to the intermediary level among those three. The mention of the *paramesê* in the *In Timaeum* is very important because it shows that the soul is represented with that note and the interval of tone between *paramesê* and *mesê*. The *mesê* ascribed to the soul represents the same intermediary character of the Soul, between the high and the low. In this context, the relation between 18 and 16 (expressing the ratio between *paramesê* and *mesê*) is analogical and associates the Soul with the relation of tone, showing that its nature is manifested in the relation between the sensible and the Intelligible.[312] As we have mentioned above, the number 18 could correspond to the Intelligible and the 16 could correspond to the sensible. The sum of these numbers adds up to 34, and can represent the totality of the scale, containing both levels (Intelligible and sensible) joined by the intermediary Soul. The relation 18/16 as Proclus says is the second epogdoic; the first 9/8, is more archetypal, or corresponds to the Intelligible. In this case, Proclus is associating numbers and ratios with cosmic/metaphysical concepts; using numbers 9, 8 and 18, 16 for ratios in the first and second octaves. Since at the same time he considers mathematical multiplication and division in a symbolic way, his examples correspond to a scheme in which the original numbers of the *Timaeus* are multiplied by 6 (6, 8, 9, 12, 16, 18, 24). As we shall see, a similar symbolism of cosmic levels and divisions can be applied to the original numbers of the progression (without multiplying them); in this case the last double octave of the diagram can symbolize the Harmony of the Spheres, which can be divided in a octave (6/12) for the Heaven or the Muses and a second octave (12/24) for the orbits of the planets, as is shown in Medieval and Renaissance treatises).[313]

It is important to have in mind another connection that Proclus introduces later on the text of the *In Timaeum*, and this is the relation 9 = Muses and 8 = Sirens (the Sirens are eight in Plato's depiction in the *Republic* X 617b 4). The relation between these levels of divine and cosmic music can be represented then in the tone whose ratio is 9/8 and also projected in the second epogdoic ratio 18/16

[312] Accordingly, since the relation can be put either way round, the soul can be identified with *paramesê* or *mesê*, and more accurately, with the relation itself, which bounds those notes in the ratio 18/16.

[313] The octave 6/12 contains the tone 9/8 and the octave 12/24 contains the tone 18/16: At the same time both octaves + the last tone (24/27) contain 16 notes.

whose addition (34) makes the complete scale of the *Timaeus*. Proclus mentions the division of the universe according to the ratio 9/8 in the context of a passage on cosmic and musical correspondences (*In Timaeum* II.234.7-25).[314]

In this passage Proclus is comparing the divisions imposed by the organization of sound on the tonal "space" or "range" of the whole scale with the divisions of the cosmos, impressed by metaphysical and numerical principles. For Proclus, the same harmonic ratios govern the organization of the scale and the cosmic arrangement of the universe. Proclus considers the symbolic/analogical meanings of each interval in the following order: the quadruple (16 representing four octaves); the fifth (3/2) and the tone (9/8), following the explanation that the whole scale comprises all these intervals, and presents the cosmological divisions of the Demiurge done according to the tetrad, the pentad (or pempad), in this order:

> Since the scale has a tetrad's worth of octaves in it (the octave being the 'most complete of concordances'), as well as one fifth, and is complete with an additional single tone, this would make it correspond to the fourfold division of the cosmos, as we said [cf. 230.15]. It proceeds downward from the Living Being Itself to the universe through the soul, and from the four Forms in the Living Being to the quadruple causes of the complete harmony in each of the regions [corresponding to these Forms]. It is through this cause that the heaven is a single cosmos that forms a concordance with itself in the celestial manner, while the Earth possesses all things in a terrestrial manner, and similarly in the case of each of the regions in between these two. Since the cosmos is not only such as to have four parts, but also such as to have five shapes (since it has a fifth form (idea), along with the four), it is plausible that the soul possesses intrinsically the concordance of the musical fifth, along with the four octaves. (*In Timaeum* II.234.7-20)

Finally, Proclus introduces the significance of the last tone (27/24 that is an epogdoic interval in the ratio 9/8):

> Since the remaining divisions are into the eight spheres of the heaven, on the one hand, and the nine of the entire cosmos on the other – the first being consecrated to the Sirens in the Republic (X, 617b) and the other to the universal Muses, from which the Sirens are derived 455 – it is again plausible that the tone [which has the ratio of 9:8] has been included with the musical scale. (*In Timaeum* II.234.20-25)

As Proclus says (II.235.2), he is analyzing the intervals in a different order than before, and the symbolism is applied in a different manner. For example, before, Proclus identified the interval of tone with the intermediary character of the Soul (the relation *paramesê-mesê*); while in this new text, the relation 9/8 is understood as a representation of the relation between the Muses and the Sirens in correlation to the spheres of the world. It is possible to apply a symbolic relation to numbers in the same ratio (9/8, 18/16 or 27/24) from many different points of view,

[314] Proclus has a similar account in II.207.20 ff.

because there is a Neoplatonic principle that maintains that the same relations or causes can be seen as operating in different levels at the same time, and in each according to the proper nature of the level in question.

Therefore, it is possible to divide the whole scale of 34 terms in two parts of 18 and 16; the first part related to the Muses that are 9 (because 18 is the double) and the second part to the Sirens that are 8 (16 is the double): as we have seen in the previous chapter the intelligible level can be associated with the song of the Muses, and the sensible world with the song of the Sirens.[315] The whole scale depends on the Monad or first term that is symbolically related to Apollo, god of Harmony and origin of the song and circle of the Muses as Musagete, as Proclus says. The relation of 18/16 as "*paramesê-mesê*" again can represent the Soul, as we have seen according to Proclus' words; in the middle of the Intelligible "song" and the sensible "song", the Soul makes the whole scale a unitary whole, a new, recovered, Unity, through the agency of harmony. The intermediary character of this tone (18/16), is very appropriate for that symbolic association. However, the symbolism only works if the ratio between the lowest of the upper 18 notes and the highest of the lower 16 were a tone (and if the former could be understood as *paramesê*).[316] According to Proclus' text this is possible, but only if Proclus retains 2048 and not 2187 in his diagram; as is very likely he does.

For Proclus, this illustrates musically the fact that the World-Soul is in between the eternal and that which moves and develops in space and time.

This interpretation is in agreement with Proclus, who also says —applying a different mathematical analogy; the Pythagorean formula of development or derivation from the Monad-Tetrad-Decad— that:

> And just as the Monad is the cause of the Tetrad, and the Tetrad in turn is the cause of the Decad, in the same manner the intellectual harmony is the source of the psychic harmony, which in turn conveys it to the harmony of the sensible realm. This is why Timaeus took the range of four octaves to be proper to the harmony of the soul: because it is a close paradigm of the harmony in the sensible realm. (*In Timaeum* II.207.28-32)

Here Proclus presents the mirroring of the Tetrad in the Soul as the cause for the scale containing mainly four octaves. After this text, Proclus explains the following interval needed in the *Timaeus* scale, the fifth, as having a harmonizing power. According to this, the musical fifth "provides the cosmos with the concord

[315] Cf. Proclus, *In Remp*. II. 239.8 quoted on p. 228 below.
[316] In this case, the note *mesê* of the whole system would correspond to number 6 in the original progression, or number 2304, according to Proclus' numbers.

which is in its parts".[317] Next to this he mentions the tone (9/8) and presents the connection of all the principles of numbers, Monad, Tetrad, Pempad and Ennead (that contains also the Octad) with the parts of the Universe symbolized in the relation between Apollo, the Muses and the Sirens (1-9-8):

> It was for this reason that the ancients set the Muses and the Apollonian Conductor [Apollo Musagetes] to rule over the universe. The one being the director of the choir [song and dance] provides a single unification of the entire harmony while the others hold together its divided procession and bring their own number into harmony with the eight Sirens in the *Republic* (617b). (*In Timaeum*, II. 208, 9)[318]

Proclus describes the scale of the song of the Sirens in *In Remp*. II. 237. 9, where he explains the concord of the Sirens as based on the consonance of the octave. The difference between Proclus' approach in his *Commentaries* on the *Timaeus* and on the *Republic*, resides in the fact that in the *Commentary on the Republic* II.4.5 ff. he seems to follow Nicomachus' order,[319] because he considers that the scale starts in the *nêtê* as the lowest sphere (although the highest note in pitch) and considers *hypatê* as the highest sphere (and lowest in pitch). In this text, the main levels are Intellect (*hypatê*), Soul (*mesê*) and Body (*nêtê*), notes that in Nicomachus correspond to Saturn, the Sun and the Moon. In the text of the *In Timaeum* II.207.28-32 quoted above, the three levels are the same, but the correspondences are Monad = *Nous*, Tetrad = Soul and Decad = Body.

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[317] We have mentioned the returning and enclosing power of the interval of fifth (see pp. 45 ff. and pp.111 ff.). According to Proclus all intervals are bonds and can represent the binding capacity of the metaphysical principles; we emphasise the cohesive capacity of the fifth according to the reasoning presented above and also because we interpret the scale as having an intermediate transitional fifth. As we shall see, Proclus seems to locate the interval of fifth in the middle of the scale (cf. II.207.32 and II.107.10). In the passage studied before (*In Tim*. II. 234-235), Proclus mentions the fifth as representing the whole (the fifth solid), which encompasses the other four cosmic solids (cf. Plato, *Timaeus* 54d-55c).

[318] On Apollo, the Muses and the Sirens cf. Proclus, *In Crat*. 176.65-71 and *In Remp*., I.69.10; II. 68.4; II.100.5.

[319] See Barker's diagram in (1989), p. 253.

Renaissance interpretations of the cosmic scale

We would like to present as an example of metaphysical/cosmic scales, the diagram in Gafori's frontispiece of *Musica Practica*, and Ramis de Pareia circles of the Muses (diagrams 2 and 3), because the visual representation of these scales would help to understand the lower part of the *Timaeus* scale. Since we do not have representations from the time of Proclus, the Renaissance cosmic diagrams, due to the importance that this epoch gave to the visual image, will contribute to understanding in a better way the levels of the scale of the *Timaeus* and Proclus' interpretation of it as a cosmic and metaphysical symbol.

Diagram 4 and 5:[320]

[320] These diagrams are taken from Haar (1974), Figs.1 and 2.

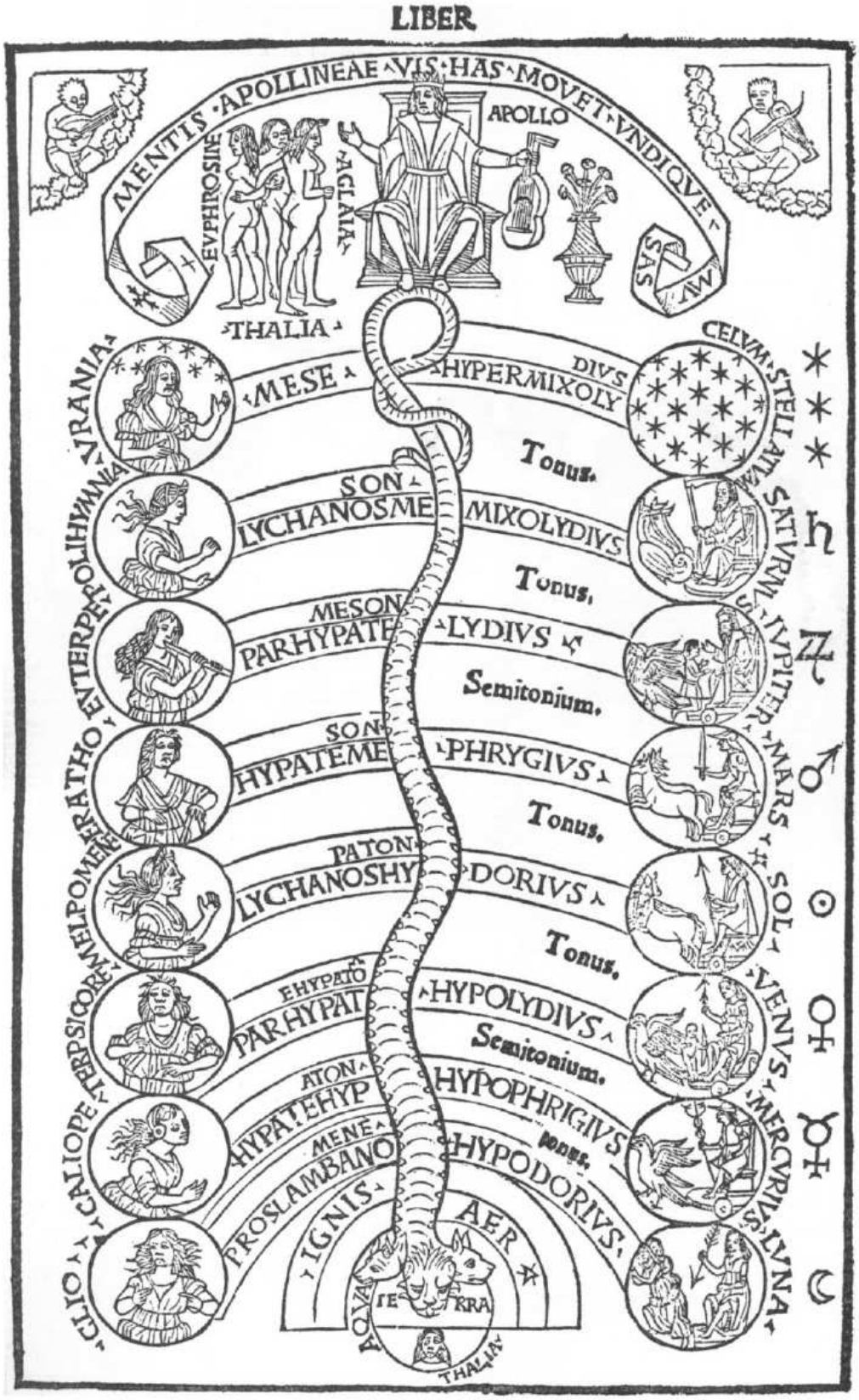

Fig. 1. Gafori, *Practica Musicae* (1496), frontispiece.

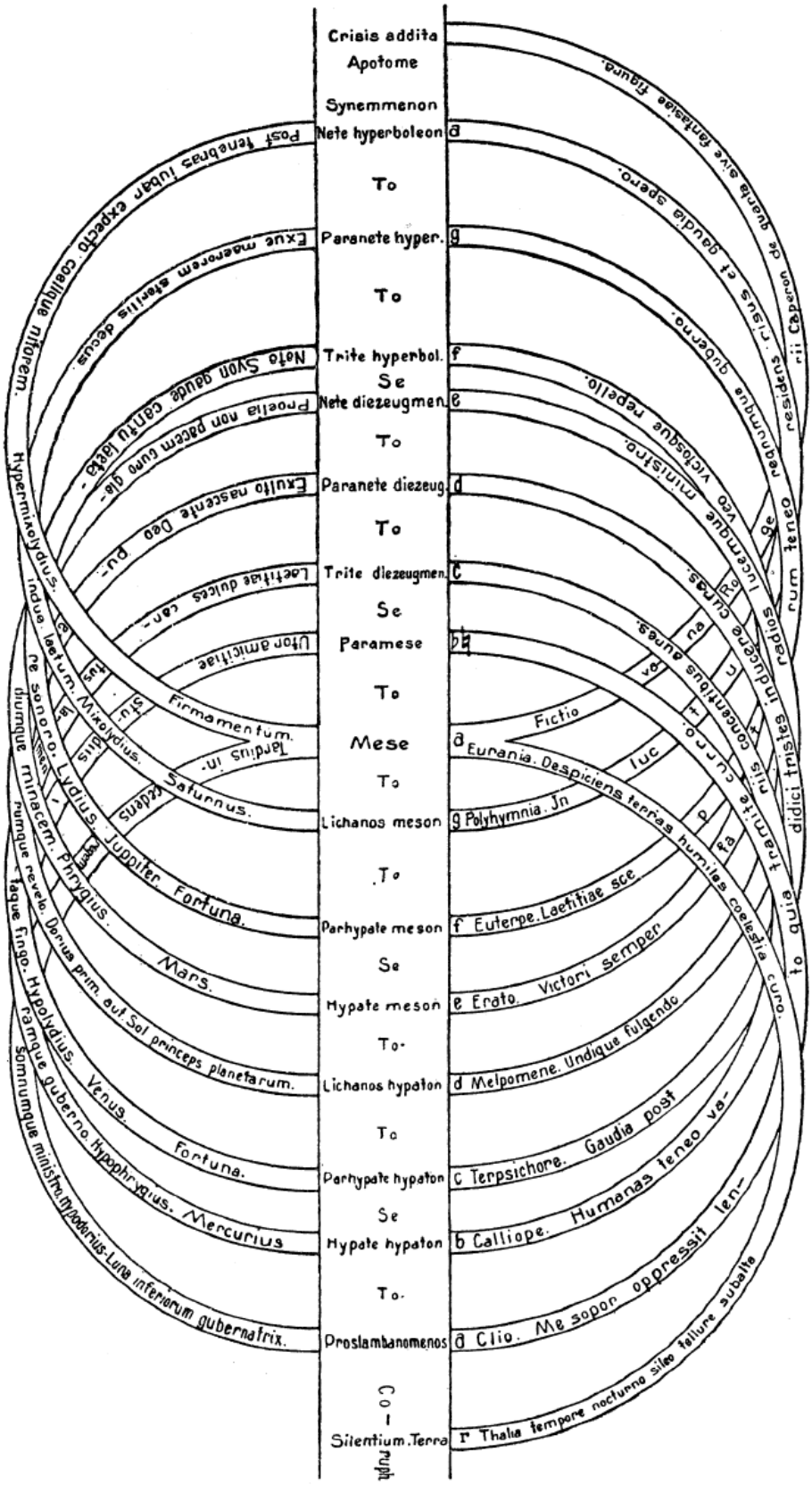

Fig. 2. Ramis de Pareia, *Musica Practica*, ed. Johannes Wolf, p. 61.

These representations can be compared to the scale of the *Timaeus* according to Proclus' (and *Timaeus Locrus*, etc.) and the numbers starting from 384 (see p.122 above). Planetary scales like Ramis' (e.g. Fludd's cosmic scales) have in common with the *Timaeus* scale that they cover more than one octave, showing in this way the analogical causal relation between one octave and the other and portraying how the notes of the planets mirror their principles, Muses or Angels in other cases. This is noticeable in Ramis' diagram where the circles show that causal connection. The scale of the *Timaeus* contains these two octaves, but the main difference is that it is longer, continuing upwards, a fact that shows that it has to represent higher principles and the whole procession from the One, because the Platonic point of view takes into consideration the intelligible principles of harmony.

An important feature shared by the *Timaeus* scale and the Renaissance diagrams is that they represent space which can be traversed up and down in a vertical line. This characteristic is due to the importance of the notion of ascent of the soul through the planets and other levels in Pythagoreanism and Platonism. Classical Greek music theory did not associate pitch of sound with height in space; the nomenclature *hypatê* and *nêtê* referred to the position of the strings in the Lyre, and how the strings were closer or further away from the performer. On the other hand, sound was distinguished as *oxys* and *barys*, adjectives that do not have spatial connotations.[321]

Consequently it is probable that spatial representations of the scale (planetary scales), up and down the cosmic hierarchy, influenced our conception of sound, which after the Renaissance became a general conception.

Our reconstruction of a Neoplatonic scale of the *Timaeus*, according to Proclus, and interpreted as containing a representation of different levels of the Universe, is also coherent with other sources, such as Plutarch, Martianus Capella and Boethius interpreting Cicero's version of the Harmony of the Spheres. The last part of the scale of the *Timaeus* can correspond to a planetary scale, like that depicted by Plutarch, Ptolemy and Aristides Quintilianus. Plutarch's scale is not completely the same as the one proposed here, because he correlates the Earth

[321] "*Oxys*" means sharp, shrill, piercing, and high-pitched and "*barys*" means heavy, strong, deep, bass. Latin: *acutus-gravis*. It was rare for the Greeks to express pitch in terms of "up" and "down", cf. ps. Arist. Pr.19. 3, 37, 47. Cf. Barker (1989), p. 252 note 20 and West (1992), p. 64 note 73.

with the note "*proslambanomenos*" (cf. *de procr. an. in tim*. 1028 F 6 – 1029 A 4) and follows an ascending scale in which the Sun corresponds to the note *mesê*. We prefer on the other hand to consider the last note (G,) as representation of the Earth and *proslambanomenos* = A, as the Moon. Aristides Quintilianus (*De Musica*, III, 21 [120, 30 and 123.2]) identified the Moon with that note and it was also the preferred interpretation in the Rennaisance.[322]

In Renaissance scales the note "G" or "Γ" usually corresponds to the sphere of Earth: for example, Ramis de Pareia's scheme (see diagram 5, p.146 above) has the notes on the right side and although he mentions the equivalent position as "*Silentium*", according to a different set of correspondences the same position appears as the note *gamma* "Γ" = Thalia, in the scale of the Muses.[323] This note G (Sol), is symbolized with the letter "G" (represented in our diagrams 1 and 2 as "G," because of the register of the lower octave) in the medieval system of notation of the musical notes with letters, which comes from Boethius. The letter "G" is the initial of *Gea* that in Greek is the name of the Earth and also gave the name to the whole scale "*gamma*" or "gamut" in English (*gamma* + *ut*; *ut* = C).

Although the comparison between Renaissance scales and the *Timaeus* scale shows very important connections, we are aware that the comparison is not sufficient to validate our interpretation of the scale of the *Timaeus* in Proclus. Nevertheless, it is fruitful to study Medieval and Renaissance and planetary scales and their visual representations —such as those in the works of Gafori, Ramis de Pareia and Robert Fludd, for example.[324] For these authors explicitly quote the sources mentioned above, following a long Neopythagorean tradition. Many of these authors start their octaves with the letter *Gamma*, and continue with *proslambanomenos*, corresponding to the Moon, and the next spheres in the order of the "perfect system". They also present correspondences with the Muses and Apollo on top of the hierarchy, a detail in these planetary and cosmic scales which is very likely due to the influence of Proclus' depiction of the sensible harmony as depending on an Apollonian chain of intelligible Harmony.

In particular Proclus' depiction of the Soul as an "essential line" is very significant for a conception such as the cosmic monochord (in Fludd, or the

[322] Cf. Barker (1989), note 172 on p. 521 of his translation of Aristides Quintilianus.
[323] See also Robert Fludd's monochords (*Utriusque Cosmi Maioris* (1617), p.90 and p.100; cf. *Anatom. Amphit. Effig. Trip*. (1621), p. 314-15), where Γ = *Terra* = 10368 (the last number of the *Timaeus* progression) and Zarlino's diagram in p. 134 above, with Γ = 10368.
[324] Cf. James Haar (1974).

Apollonian serpent represented in Gafori's frontispiece for example), because the musical string is a line divided harmonically and produces the sounds in different levels or octaves.[325] In addition, Proclus' type of consideration of the circularity of the Soul (a feature which appears in Plato's *Timaeus* 36 b-c, when the Demiurge bends the linear strip of the mix of the Soul in a circle) could have influenced Ramis' diagrams of the cosmic scale, in circles attributed to the Muses.[326]

Even if the Medieval and Renaissance authors were influenced mainly by Latin sources, such as Macrobius, Calcidius, Martianus Capella and Boethius, the tradition of Greek sources is present in those authors that were transmitting and translating in Latin the Greek versions of the cosmic scale present in sources like Plutarch, Nicomachus, Adrastus, Severus, Theon of Smyrna and Ptolemy.[327]

This is sufficient concerning spatial representations of the scale; however the same scale can be referred to the concept of time, because the same spatial hierarchy of spheres of planets and stars is simultaneously a combination of different instruments of time, showing the intimate connection of the four mathematical sciences. This feature related to the dimension of time can be appreciated if we consider that the numbers of the scale of the *Timaeus*, in the tradition preserved by Proclus, represent cosmic cycles as well.

Cosmic cycles and the musical scale of the Timaeus

We mentioned above that the choice of the numbers starting at 384 goes beyond the practicality of avoiding fractions, and is based on musical and metaphysical reasons, because in the context that we are studying, music is employed as a symbol or mirror for metaphysical realities. The reason for the choice of the numbers between 384 and 10,368 (in the same proportion as the numbers of the *Timaeus* 1-27) is better appreciated when we realize that the numbers are related with cosmic periodicities or cycles. The first interesting information is that 384 is

[325] Cf. Proclus, *In Timaeum*, II.245.25 ff. Proclus ascribes the representation of the harmony of the Soul as a line to Severus in II.192.25 ff.

[326] The circular representations have their source first in the returning character of the musical fifths (studied above, pp. 45 ff. and 111 ff.), and secondly in Ptolemy's association of intervals with the Zodiac and the position of the planets on it. Cf. Haar (1974) and Godwin (1987) on Gafori's and Ramis' diagrams.

[327] Cf. Courcelle (1969) and (1967). See also Obertello (1974) and Chadwick (1981); both authors have studied the connection between Boethius and the Neoplatonic school of Alexandria. Boethius probably studied with Ammonius, son of Hermias and disciple of Proclus.

in the ratio of 256/243 with the number $27^2/2$ or 364.5 (= 729/2).[328] The number 27 is very close to the period of the Moon (in Pythagoreanism this number represented the Moon), and 364.5 to the period of the Solar year. The triple progression 1-3-9-27-81-243-729-2187 had cosmic connotations, as can be seen in Plutarch's depiction of a Pythagorean system of correspondences (*De an. procr.* 1028 b):

Central Fire	Counter Earth	Earth	Moon	Mercury	Venus	Sun
1	3	9	**27**	81	243	**729**

A very important testimony shows that for Philolaus the number 729 was related to the doctrine of the "great year"; that is also known as the "perfect year", introduced precisely by Plato in the *Timaeus* (39 d). Huffman[329] comments on Philolaus' Testimony A 22 (DK) and explains that it is an "attempt to harmonize two important ways of measuring time, the lunar month and the solar year." Huffman says that Plutarch's system cannot be a faithful depiction of Philolaus' astronomical system because the Sun should be associated with the number seven instead of 729 (according to Aristotle, "being the seventh orbit counting from the fixed stars inward"). But Huffman has not noticed that 729 is the seventh number in the triple progression; and that symbolic correspondences are not always evident, and this relation of both different sevens can be enough to apply a cosmic analogy.

Censorinus is the source for Philolaus' concept of the great year. He says that for Philolaus the great year consists of 59 years, in which there are 21 intercalary months and that he proposed that the solar year has $364^{1/2}$ days.[330] $364^{1/2}$ is precisely the number that is in the relation of *leimma* with 384 (and it is half of 729). The harmonization between solar and lunar years is shown when 59 is multiplied by 12 to convert to months; this together with 21 intercalary months adds up to 729 (59 x 12 + 21 = 729).[331]

This is not the only connection with the theory of the perfect year that, as Huffman explains it, is a "period in which the solar year coincides not only with

[328] Cf. *Excerpt. Nicomach*. 2. (267 ff.) and Zanoncelli's note *ad loc*. (1990), p. 231. Cf. Andrews (1917), p.154.
[329] Huffman (1993), p.277.
[330] Huffman's translation p.277.
[331] Cf. Huffman *ibid*., for this and other calculations to estimate the number of 364.5 as the number of days in the solar year.

the end of the lunar cycle but also with the end of the period of each of the other planets." Plato explains in *Timaeus* 39 d, that all the planets are "instruments" that mark the time in their periods, not only the Sun and the Moon, and when all of them return to the same position (in line) and in the same part of the sky that they were in the first day of the Creation (the primordial time, which is symbolically the Unity before and beyond time, and eternal) the greatest year would have passed.[332]

De Callataÿ has studied the theory of the perfect year in Plato extensively in a recent book.[333] What this author says about cosmic harmony is relevant to our topic. He considers that the *Timaeus* musical scale must be related to the theory of the perfect year in some way. After all, the World-Soul, composed in the harmonic way depicted above, is the principle that moves the circles of the World, and is responsible for the periods of time.

De Callataÿ writes:

> It is nevertheless worthwhile recalling the importance of the Pythagorean theory of the harmony of the spheres in Plato's writings, as we find it unambiguously expounded, for instance, in the myth of Er at the end of the *Republic*. Considering on the other hand, the constant parallels between astronomy and music in Plato's classification of sciences, it would be surprising if the most perfect of all achievements in astronomy and music should not coincide. In other words, would it be possible to imagine a better completion for the harmony of the spheres than at the end of the Great Year, when all eight notes are perfectly joined together, so as to produce the best accord possible?[334]

As de Callataÿ continues, explaining the essential link between these two aspects, the real sense of the harmony between music and astronomy can be understood only in relation to metaphysics. The division of the harmonic structure of the World-Soul in the circle of the Same and the circle of the Other expresses, according to de Callataÿ, a division of the Primeval Unity.

> […] the Same and the Other were separated from each other, and this operation was the division of the Primeval Unity (the Same), giving birth to Duality (the Other). The division of the circle of the Other into six different parts, so as to produce seven unequal circles, is the expression of a further separation from Unity: Duality is the foundation of all numbers. […] At great intervals of time, the movement of the Other comes back to its original position (the conjunction of the seven planets), so as to restore the fundamental Duality. When, furthermore, this renewed Duality comes back into conjunction with the circle of the Same (the conjunction of the seven planets with the starry sphere), then Duality returns to

[332] There are probably other conjunctions, and probably with all the planets in line but in other signs of the Zodiac; this could mark other parts in the cosmic cycle and not the end or beginning of the greatest cosmic cycle possible. There are different ages or seasons in the world year: these are the ages of the world.
[333] De Callataÿ (1996).
[334] *Ibid*. p.8.

> the Primeval Unity. The period of time required for this return to Unity to be fulfilled is called, in Plato's philosophy, the Perfect Year.[335]

We have seen that Proclus as well understands the harmony of the world as a return to the Unity of Apollo.

> The Musagetes fills the Universe with a divine Harmony that makes it a unitary cosmos and harmonizes everything with three terms (*horoi*): the Intellect as a *hypatê*, the Soul as a *mesê* and the Body as a *nêtê*; and that makes the whole perfect as a true demiurgical Lyre, and he alone has the power. The Muses, on the other hand, are a manifold originated in the Musagetes, that having proceeded from the Monad of this god until the complete number (*ton holon arithmon*), longs for being a new unity (*hen neon*). (*In Remp.* II.4, 5 ff)[336]

De Callataÿ does not enter into a detailed explanation of the relation between the perfect year and the harmony of the World-Soul of the *Timaeus*, because it is outside of the scope of his work. However he introduces another important aspect in his exposition: Plato's theory of the Nuptial Number of Divine Begettings in the *Republic*, which is also a section (a discourse of the Muses) based on Pythagorean considerations of the relation between harmonic numbers, cosmic periods and human periods in life. Proclus in his *Commentary on the Republic* (II. 93, 23), as could be expected of a Neoplatonist, claims that the periods of life at the human level should be related to the periods of life of the World;[337] consequently the Geometric number of the *Republic* (which refers to human life) should be related or harmonized to the Perfect number of the *Timaeus* (which refers to the life of the World).[338]

De Callataÿ, following various sources, estimates that Plato's Geometric Number is 25,920,000; which is a figure that contains two harmonies that correspond to the value of 12,960,000.

De Callataÿ interprets Proclus as saying that the Perfect number is a part of the Geometric number; and concludes that the Perfect number of the *Timaeus* is 25,920 and that the Great year measures 25,920 years.

The number of "zeroes" on the right of the figure is not totally relevant. What is important and meaningful from a harmonic point of view is the main part of the numbers. This part, due to symbolic reasons, is what counts: the proportions between the numbers. In traditional cosmological texts (which cannot be studied

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[335] De Callataÿ, *ibid.*, p. 8-9. These Neoplatonic doctrines reappear in the music of Beethoven, who expresses the return to Unity on the starry Heaven at the end of his 9th *Symphony*, showing the passage of the four ages of the world in the first movement.

[336] Cf p.143 above.

[337] This is the traditional, also Presocratic, consideration of the analogy between the periods of human life and the four ages of the World.

[338] Cf. de Callataÿ (1996), p. 10 ff.

here) the key to the interpretation of the number of chronological years for each age is expressed according to numbers that are proportional to the given numbers (2592, 432, etc.). A reason for not presenting the chronological numbers of the ages, and for expressing them in proportional multiples, is that Pythagoreans or Neoplatonists did not consider it appropriate to reveal to everybody in published works the more important doctrines, such as this one concerning the cosmic cycles (Cf. Plato's *Letter* VII, 344c).

If we do not consider the differences of the "zeroes" at the end of the numbers, the more significant part of them, i.e. 432; 2592; 1296; etc. are numbers that are included in the scale of the *Timaeus* reported by Timaeus of Locri and Proclus.

De Callataÿ follows in his explanation (*ibid*. p.30) the Indian system of *yugas*. According to this, the four ages (*yugas*) are arranged in the following system: *Mahâyuga*: 4,320,000; which is the complete period that encompasses four ages arranged in the ratios 4:3 and 3:2. This *yuga*-system, as de Callataÿ correctly remarks, "coincides exactly with the progression of the Pythagorean *Tetraktys*, since the four subdividing periods follow the sequence 4 + 3 + 2 + 1 = 10." The four ages in which the *Mahâyuga* is divided are: *Krtayuga* = 1,728,000 years; *Tretâyuga* = 1,296,000 years; *Dvâparayuga* = 864,000 years and *Kaliyuga* = 432,000 years. All these are multiples of numbers present in the *Timaeus* scale in the harmonic relations between: 1728 (d') – 1296 (g') – 864 (d'') – 432 (d''').

De Callataÿ concludes on p. 32 that Plato's system of four ages of the World follows a Great Year subdivided into four periods that are related to each other in the proportion 4:3:2:1. De Callataÿ seems to assume shorter periods than those of the Indian sytem, and this can be seen especially in his calculation of the Iron Age of only 2,592 years:

10,368 years (Golden Age) + 7,776 years (Silver Age) + 5,184 years (Bronze Age) + 2,592 years (Iron Age) = 25,920 years.

De Callataÿ does not include all the correspondences with the musical scale, because he does not mention that 10,368 is the last number (corresponding to 27 = G,) in the progression of the *Timaeus*, according to Timaeus of Locri and Proclus. The four cosmic numbers appear in the scale, in the relation between the notes G, – C – G – g.

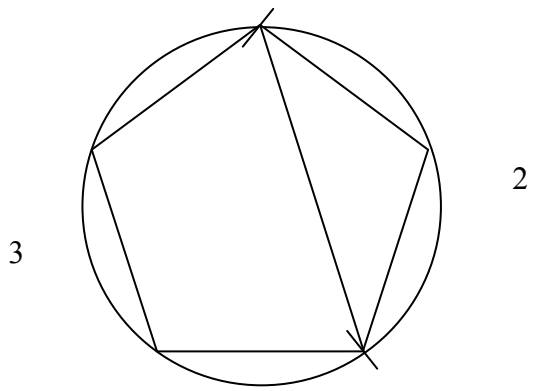
It is outside the scope of this study to try to find a whole set of correspondences between the doctrine of cosmic cycles and the musical scale of the *Timaeus*, but we can point out some musical applications to this particular topic. The first one and most noticeable is:

a) that the Ages are harmonically related between themselves and follow the harmonic progression of the *Tetraktys*. A second and very important aspect is b) that the numbers starting from 384 employed to interpret the harmonic structure of the Soul in the *Timaeus* —since at least Crantor as we have seen—, are numbers directly connected with the cosmic periods (whether interpreting these numbers as the amount of years of each Age or as proportional numbers that symbolize the actual chronological durations). The third possible interaction between music and cosmic periods follows from the previously mentioned ones: c) each Age can be related to the others in a cosmic scale, which is analogous to that of the yearly Seasons (or an arrangement of the seasons according to musical intervals), like the one attributed to the Chaldaeans by Plutarch in *De An. Procr.* and to the Pythagoreans by Aristides Quintilianus.[339] Although it is true that Plutarch and Aristides are referring just to the seasons of the solar year, a similar analogy can be applied to the Greater Seasons (the Ages of the World) of the Great Year. Therefore, from these cosmic analogies a theory of the relation between historical events in the World chronology and musical intervals could have been studied in Neoplatonic circles. The best example of this kind of theory about the consonance between the rhythm of chronology in the human world with the rhythm of Cosmic Harmony, is Plato's *Republic* (Book VIII), the section about the Nuptial number commented on by Proclus and Ficino.[340]

Another basic analogy between chronology and music is the order of the days of the week. The arrangement of the names of the days follows a musical organization of time and space according to the correspondences between days, planets and musical notes in a system of perfect fifths or fourths in the Chaldaean order.[341] The importance of the interval of fifth for cyclic considerations is well known because of the returning nature of this interval. It is interesting also to notice that the traditional doctrine of the Ages of the World is based on the

[339] Plutarch, *De An. Procr*. 1028 E-F; Aristides Quintilianus, *De Musica*, III, 19 (p.119, 15-18 W.-I.). Cf. Cherniss' note c in his edition of Plutarch (1976), p. 328; Burkert (1972), p. 356 and Neugebauer (1942) pp. 455-458. Cf. also pp. 173 ff. below.
[340] Cf. Allen (1994). See p. 152 above.
[341] Cf. p. 65, note 152, above and pp. 243 ff. below.

proportion of *five* Great Years contained in the whole cycle divided according to the proportions of the *Tetraktys*.[342] The Golden Age contains two Great Years and for this reason, if we represent the whole Cycle in a pentagon inscribed in a circle, the relation between this Age and the others is in the ratio of fifth; each side of the pentagon represents one Great Year of 12.960 years; and the Golden Age is composed of 25.920 years (two Great Years):



It is important to recall what Proclus says in his *In Timaeum* (II.207.32-208.2), about the interval of fifth:

> And since there are five shapes and five 'centres' in the Universe, that make the whole complete, the musical fifth also provides the cosmos with the concord which is in its parts (*hê dia pente harmonia tên kata ta merê didôsi tôi kosmôi symphônian*)".[343]

In this context, it is appropriate to consider why de Callataÿ abandoned so fast the comparison between the Greek cosmic cycle and the traditional Indian system. His arrangement of the Four Ages, purportedly according to Plato, presents very short chronological periods. The chronology could be better understood if one considers the importance of number 5 and 15 as proportional numbers, which are meaningful in the Platonic tradition we are investigating.

We are not claiming that our interpretation is the "right" one and de Callataÿ's is "wrong". We are presenting a different reconstruction of the theory of the cosmic cycles, following a comparative methodology, which allows us to find

[342] It is not a coincidence that string instruments developed in the Renaissance in Italy in particular, have four strings tuned in fifths, see p. 176, note 388 below.

[343] We are going to study this passage in more detail below (see p. 166 ff.). We modified Baltzly's translation in order to show that Proclus is talking about the musical fifth in terms of its fiveness. Baltzly translates: "And since there are five shapes in the universe and since the centre serves to make the whole complete, the musical fifth provides the cosmos with a concord in virtue of its parts." Since Proclus is talking about the attributes assigned to the Pentad, he compares the musical fifth (an interval that contains five notes) with two groups of five: shapes and centres. It should be "five centres", as can be seen if one compares this passage with II.107.10, where Proclus mentions the centres again.

different correlations between numbers and harmonic ratios. If one considers that numbers 5 and 15 have an important role in regard to cosmic cycles in other sources, it is reasonable to use them in the interpretation of the Platonic doctrine of the Great Year.[344] Besides, if we multiply the significant numbers by 15 the result is a system composed of 5 "Great Years" (of 12.960 years),[345] where the measure is given by the "precession of the equinoxes", which corresponds to 25.920 years (a number equivalent to two Great Years).[346]

De Callataÿ on the other hand, prefers to interpret the whole cycle as being included in only one Great Year of 25.920 years. In comparison to other sources, such as Cicero, this Great Year is too long and the Ages included in it are too short. Furthermore, it could be added that if a period is a "year", therefore it can be understood as a "part" of a greater cycle (even if this part —a year— is called "Great") and not as the whole cycle containing the Ages. The Great Year can be included harmonically in a greater cycle if its measure in calendar years is shorter. In this sense, Ancient cultures considered long periods containing different sets of years, according to symbolic numbers (e.g. weeks of 7 years in the Hebrew calendar).[347] The group of Great Years can be analogous to those groups of years and in this case the cycle contains 5 of these Years.

Therefore, if one follows different calculations of the periods than those obtained by de Callataÿ, taking into account the numbers from the harmonic series of the *Timaeus* studied above, the chronology that results is different from the one proposed by this author. If we consider the four numbers of the series, which are

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[344] Number 15 is an important "cyclic" number not only because 5 x 3 = 15 (Nicomachus, *Arithm*. II.17 and Proclus, *In Timaeum* II. 233.16), but also because it is related to the cycle of the Moon. See Burkert (1972) p. 470, mentioning that number 15 is dedicated to the goddess Ishtar in Babylonian numerology. Cf. Langdon (1914), pp. 174-176, who explains the correspondence between Ishtar, number 15 and the full moon. For a similar association between 15 and the full moon see Philo of Alexandria, *Quaestiones et solutiones*, 91. Cf. also Proclus' quotation of Theodore of Asine at *In Timaeum* II. 218.4, where number 15 is associated with the heavens.

[345] Cicero mentions the Great Year (*De nat.deor*. II.51-53) and calculated its length as 3000 years (cf. Servius, *Comm. In Aen*. III.284) or 12,954 years (cf. Tacitus, *dial. de orat*.16). The Great year comprises 15,000 years according to Macrobius (*Comm.Somn.Sc*. 129.8-25 [II.XI.10-12]). See de Callataÿ (1996), p.35; pp. 42-58 and 120-127.

[346] The theory of the precession is mentioned by Hipparchus and Ptolemy, but Proclus does not admit it (*In Timaeum* III.124.19-125.4, cf. III.62.6-63.24 and *In Remp*. II.220.4 ff.). See also Siorvanes (1996) 289-290.

[347] Cicero mentions that the Great Year must comprise a fixed and definite period (*De nat.deor*. II.51-53). One could interpret as Callataÿ does, that the Great Year is the greatest period (and since the cycle starts again at the end of the last Age, the period can recur cyclically; and only in this sense another Great Year can reappear), or on the other hand, as in the Indian system, the Great Year is only a fixed measure or period inside a much greater period.

in the relation of the *Tetraktys* (1-2-3-4) and multiply them by 15 (triple of 5) it is possible to calculate:

1728 x 15	=	25,920	(4)	Golden Age
1296 x 15	=	19,440	(3)	Silver Age
864 x 15	=	12,960	(2)	Bronze Age
432 x 15	=	6480	(1)	Iron Age

The numbers in the *Timaeus*' series (432, 864, 1296 and 1728) appear in the series of the Indian Ages of the World (with zeroes added); they are also in a proportional relation of 1-2-3-4. The numbers that result from the multiplication by 15 correspond to years in a chronology that is more plausible than the one considered by de Callataÿ.[348] According to de Callataÿ's calculation, the myth of Atlantis should be placed in the Silver Age, but it would be more appropriate to situate it in the Bronze Age, because in the *Timaeus* (23e) the Egyptian priest told Solon that the Fall of Atlantis occured 9000 years before their time. In this context is not possible to interpret, as de Callataÿ does, that for Plato the Bronze Age had the length of 5184 years and the Iron Age that of 2592 years, which are too short as periods.

We cannot study the theory of the Ages of the World in depth here; what is important for us is to mention the historical information which tells us that the Pythagorean and Platonic tradition did take notice of the correspondences between chronological periods (e.g. the seasons of the year) and the musical notes. Another detail that we wanted to point out was that the number of years for each Age of the World is also contained in the *Timaeus* scale and the importance of number 5 and the interval of fifth, for cyclic proportions.[349]

[348] It is important to notice that these multiples of 15 are also divisible by 360; e.g. 12.960/360 = 36. We have studied how Philolaus, Proclus and Timaeus Locrus paid attention to these numbers (36 and 360).

[349] Another important number for cyclic proportions is 9, also related to 36, which is the number of notes of the *Timaeus* scale, in Timaeus of Locri's version. When we studied the numbers that start from 384 in Proclus we mentioned that the number for the *apotomê*, 2187, and the other numbers for this interval, 4374 and 8748, could have been preferred by *Timaeus* because they add up to 9: as in 2+1+8+7 = 18 = 1+8 = 9, which is also the case of the cyclical numbers of the Ages of the World.

Chapter 3. More metaphysical and cosmological considerations of the *Timaeus* scale

The circles in the Scale of the World-Soul

In our diagram 1 (p.122) of the whole scale we showed the division in two halves that have not exactly the same composition: one has 18 terms and the other 16. This division of the scale could represent the two circles depicted by Plato in the *Timaeus* 36b - e: the Circle of the Same and the Circle of the Other. The Circle of the Same corresponds to indivisible reality and the Intelligible, and can be represented in the first half that contains 18 terms, which as we have seen are related to the Muses (double of their number: 9 x 2).

If we divide the scale in 18 and 16 terms, there is an interval of tone between both sequences of terms (from 384 to 2048 = 18 terms and from 2304 to 10,369 = 16 terms). The tone between both sequences (2304/2048; terms number 18th and 19th) should be understood as the ratio between the notes *paramesê/mesê* of the whole scale, according to what we said in page 141 above (cf. also pp.136 ff.).

The 18 terms of the first part of the scale correspond to the first double octave contained between 1-2-3-4 (in the original progression) plus a fourth (2048/384 in the ratio: 16/3 = 4/1 x 4/3). The upper double octave (1/4) of the scale, contains the numbers of the sacred *Tetraktys*; and for that reason it is an appropriate symbol of the Intelligible.[350] The 16 terms of the second part of the scale cover another double octave plus a tone (10,368/2304 in the ratio 27/6 = 4/1 x 9/8).

The transitional fifth in the system is represented in the ratio 2304/1536; it results from the addition of the intermediate tone to the fourth of the first sequence (2304/2048 x 2048/1536 = 3/2). The transitional fifth shows the passage from one half to the next, to the Circle of the Other, that starts in number 6 (of the original progression = 2304 of Proclus' progression). It is also appropriate that this second half that represents more suitably the World-Soul (after the Intelligible) starts in the number 6 because it was traditionally related to the generation of the soul in Pythagoreanism.[351] The number 16 (total of the second

[350] Cf. Proclus' *In Timaeum* II. 207, 28-32 about the Tetrad, quoted on p. 142.

[351] On 6 as the number that generates the soul, see [Iamblichus ?], *Theologoumena Arithmeticae* p. 40 Ast 52 De Falco (Diels - Kranz 14.8). 36 is also a circular number (the square of 6, which also was considered cyclic by Proclus) and we have seen that for Timaeus Locrus there was a connection between this number and the total number of terms of the scale of the World-Soul. Cf.

half) on the other hand corresponded to the Sirens (8 x 2) and the sensible harmony (see pp.140-143 above).

Although the diagram as a whole portrays the World-Soul, since as we have seen, Platonism is a philosophy of mirroring, every level is contained in every level in an appropriate way. For this reason and because the World-Soul according to its intermediary position, contains and mirrors the whole Universe, the diagram and its circles reflects the Intelligible, as an image, the World-Soul in itself as intermediate, and the sensible cosmos as its archetype.

We are going to show how this can be illustrated in a musical diagram composed by circles (see diagram 6 on p.161). If we think of the diagram and sets of circles as containing the whole Universe, then the first large circle (between 1/4; notes e'''- e') will represent the Intelligible world (we can call this the "*double octave of the Intelligible*") that includes two circles as if it were the previous unity that contains in a causal way the two circles in which the World-Soul will be divided. These inner circles correspond to genera of being: "Sameness" corresponding to the circle that starts in 1 and "Difference" corresponding to the circle that starts in 2.[352] If we consider the Pythagorean background of the composition of the Soul it is appropriate that "sameness" is connected to number 1 and "otherness" or "difference" to number 2. The projection of these components or genera in the second great circle below will produce the Circle of the Same and the Circle of the Other in the World-Soul. In the first great circle we are still in the intelligible level and "sameness" and "otherness" are considered in their indivisible character, considered by Cornford,[353] following Proclus' interpretation, as "Indivisible Sameness and Indivisible Difference", that compose a "circle" or unity of "Indivisible Existence" or Indivisible Essence (*ousia*). This corresponds in our diagram to the first great circle 1-2-3-4 that comprises the *Tetraktys* of the Principles.[354]

The fifth in the middle point of the scale (between 4/6; notes e'- a) could correspond to the Soul in its intermediary position and the second greater circle (between 6/27; notes a – A, + additional G,) will represent the paradigm of the

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also Nicomachus, *Introd. Arith*. II 17,7, p. 111 (Hoche). On 6 as perfect number, result of 1 + 2 + 3, cf. K. Praechter (1911), p. 407 ff. Cf. also Aristides Quintilianus, *De Musica*, III.12 for musical-metaphysical associations concerning number 6 and 36 (see also chapter 5, 102.10).

[352] Cf. *Timaeus* 35 a ff. and Proclus' *In Timaeum* II. 132.3 ff. and 155 ff.

[353] Cornford (1937), p. 61.

[354] Compare diagram 6 (p.161) with diagram 1 (p. 122) for these correspondences.

sensible World (we can call this "*the double octave of the paradigm of the sensible World*"). This double octave can represent the model of the visible manifestations of the two circles of the Soul in the sensible world, the Circle of the Same = Heaven as unitary (between 6/12; notes a – A) and the Circle of the Other (between 12/24; notes A – A,), which is divided, containing the orbits of the planets. The additional note 27 = G, corresponds to the Earth (that stands for the visible level as a whole).

Alternatively, if we think of the entire diagram as the World-Soul, then this first circle would be the Circle of the Same as a reflection of the Intelligible and the second circle would represent the Circle of the Other.[355]

If we consider the second double octave (between 6 and 27) as the planetary scale (similar to the Renaissance scales studied above; diagrams 4 and 5), we can say that the first inner circle (6 = a – 12 =A) represents the Heaven (in its undivided wholeness, image of the Intellect or Circle of the Same), while the second inner circle is divided (as an image of the Circle of the Other) according to the spheres of the planets (12 = A – 24 = A,).[356] Therefore, there can be two representations of the Circle of the Other, one is the second big circle (6-24), if we consider the whole as the World-Soul. Another possible interpretation is that the Circle of the Other is reflected as the second inner circle (12-24) in this big circle (6-24); in that case the two big circles of the whole scale, would represent: the first the Intellect and the second the World-Soul. This second circle was understood as divided in one circle or octave for the Muses (or Angelic Hierarchies in the Middle Ages) and another octave or circle for the planets. We can mention these alternative interpretations because of the Neoplatonic principle that all is in all, according to the mode of each level.[357]

We can represent these mirroring circles in correlation with octaves, because according to the mathematical proportions of the intervals half of the circle, 180º, marks the octave, being in the relation 2/1 and consequently the proportion 3/2 in

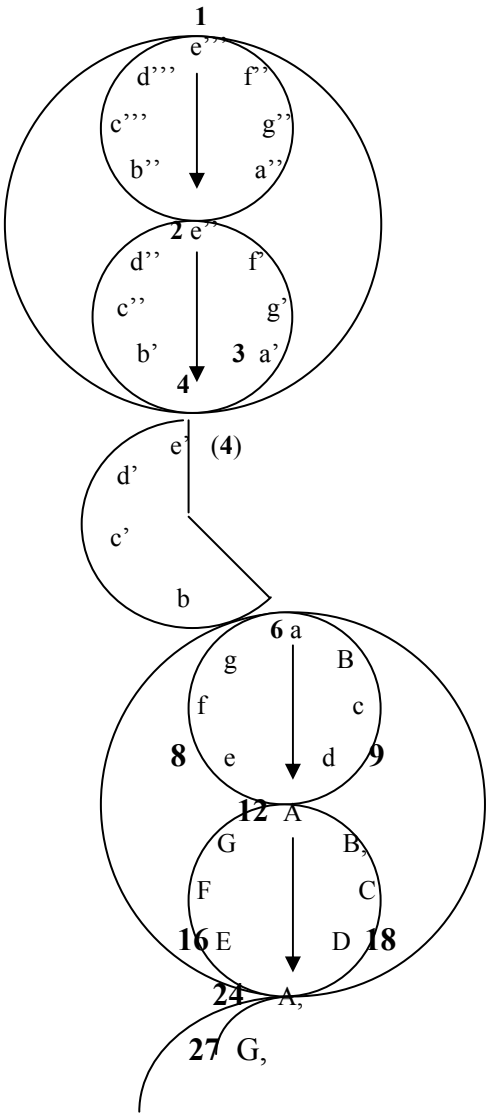
[355] In the cosmic interpretation of the diagram, the first great circle was the Intelligible World and contained analogically the two smaller circles as archetypes of the circles of the soul; the second great circle, then corresponds to the World-Soul in its proper level, and containing in turn the archetypes of the movements of the sensible world in the two smaller circles, because the Soul is the paradigm of the order of the sensible world.

[356] However, as we have already seen the note 12 = A represents again the Heaven of the fixed stars in the planetary ocatave (the second inner circle: 12-24).

[357] Cf. Siorvanes (1996), pp.51 ff.

the circle marks the interval of fifth.[358] If we put the whole scale in circles, the mirroring is made more evident and also the division in 18 + 16. The first circle of 15 terms (double octave) contains two small circles (octaves) followed by the fifth of transition (a fourth plus a tone which is already part of the following circle) and another circle of 15 terms (if we start counting again from 6 = a), containing the two octaves of the harmony of the spheres; plus one tone = 16:

Diagram 6



[358] Cf. McClain (1978), pp. 51 ff. quoted in Godwin (1987b), p.298, for similar circular diagrams.

The two big circles represent the two circles of the World-Soul: the Circle of the Same (akin to the Intelligible) and the Circle of the Other (akin to the sensible World). The second big circle represents the paradigm of the sensible world, containing a reflection of the big circles of the Soul within the Soul (from number 6 to 27 or 2304 to 10,368 in diagram 1, p. 122) that in the double octave + tone shows the Harmony of the Spheres paradigmatically and the Heaven (that imitates the movement of the Intellect or the Circle of the Same):

Diagram 7:

a		
g		
f		
e		
d	HEAVEN = Circle of the Same	
c		
B		
A	HEAVEN	
G	SATURN	
F	JUPITER	
E	MARS	
D	SOL	Circle of the Other
C	VENUS	
B,	MERCURY	
A,	MOON	
G,	EARTH	

We can see here how the *Timaeus* scale ends with a G, corresponding to Earth and the planets and Heaven are contained in the perfect system (*systema teleion*) with Moon as *proslambanomenos* as we have seen above. The tone between 24/27 (A, - G,) is outside the last circle because it belongs to a different level, the sensible world in itself. In this case the Earth represents the whole sensible world; because the other levels are still the paradigm of the orbits of the planets *within* the World-Soul.

In this diagram (6), Heaven is portrayed twice, as the last note (A) of the octave of the planetary scale of the "harmony of the spheres", or as a different complete

second octave (a – A) above. This is possible because the heaven as indivisible and transcendent principle could be represented as a cosmic level in itself, or alternatively in relation to the following level as its "*akron*" or summit (because the summit already contains the level that follows underneath). As Proclus, says, every summit (*ta akrotata genê*) is already akin to the following higher level (Cf. *El. Theol*. Props. 110, 112 and specially 147, 148). The Heaven is the culmination, the highest part of the World; for this reason it is the part which is more similar to the spiritual whole that contains everything below. The last note of the planetary octave can be seen as containing and summarizing the entire octave or as the first note of the following octave (in ascendant sense) that represents the spiritual levels that follow the World beyond its edge, which is often correlated to the Muses.[359]

We are using in our diagram the so called "Chaldaean" order of the planets, which is not the "Platonic" (that has Moon, Sun, Venus, Mercury), because Proclus accepts both orders.[360]

The fact that each circle represents one octave is appropriate because of the cyclic nature of the octaves that repeat the same structure from low to high. Ptolemy portrayed musical intervals in circular form in his *Harmonics* (101, 20 ff).[361] He was interested in showing the musical relations between the planets and the Zodiac, and since the Zodiac is divided in 12 parts the octave 12/6 was suitable for this representation. If we divide a circle in 12 parts, the relation between half of the circle and the whole will be the octave (2/1), the relation between 12 and 8 parts will give the fifth, and the same for 9/6 and 6/4, all of them in the ratio 3/2. In a similar way the other intervals correspond to the proportions between segments of the circle. We are not interested in showing an accurate geometrical representation of this theory here; our main interest is to reconstruct a possible way of portraying the whole scale of the *Timaeus* taking

[359] In that case that octave would represent what is known as the "heaven of the heaven" in authors like Philo of Alexandria or Saint Augustine (*Conf.* XII.2-15). Cf. also Plato's *Phaedo* about the real Heaven and other levels of heaven. Cf. Pépin (1977). Saint Augustine identifies this "heaven of the heaven" with Biblical names such as Wisdom (*Sapientia*) and House of God "*Domus Dei*". It is interesting to note that this expression is mentioned in *Genesis* 28, 12-13 as the place where Jacob dreams about the ladder, which he recognizes as "*Domus Dei*" and "*Porta Caeli*". The symbol of the ladder with angels climbing up and down might have been related in the Middle Ages and Renaissance with the musical octave that corresponded to the Muses in Ancient Greece.

[360] Cf. Proclus *In Remp*. II, 220.4 - 221.10; *In Timaeum* III, 60.31 ; 62.6; 67.27 - 68.16; *In Alc*. 195 - 196.

[361] Cf. Barker (1989), p. 381 ff.

into consideration mainly the octaves represented in circles, and also the interval of fifth (with the ratio of 3/2), plus an additional tone. In this manner, it can be seen more clearly how different metaphysical levels can be symbolized in the musical scale and how the last part or lower double octave could have been interpreted as the planetary scale together with levels in the heavens, as in the Renaissance representations discussed above.

We have to admit that Proclus doesn't mention this arrangement of circles, but he mentions how the divisions of the scale can represent metaphysical levels, as we have seen, and also refers to linear and circular ways of representing the World-Soul, because both ways are already present in the text of the dialogue (*Timaeus* 36b – e and *In Timaeum* II. 237.8 – 257. 29, a section in Proclus' *Commentary* about the "Form of the Soul").

The musical scale in itself is a combination of a linear structure from low to high and a circular one because of the returning fifths and octaves. For this reason, it is difficult to make a complete and exhaustive diagram of the correspondences between the circles and the intervals of the scale, and our representation is a mixture of the linear scale and the circles as octaves, but in reality both circles are one inside the other, bent on each other and no longer in a vertical line, as the scale from 384 to 10,368 was. Another advantage with the circular representation is that the composition of the scale (cf. Proclus, *In Timaeum* II, 234. 5) as a group of four octaves, one fifth and a tone, can be pictured more easily. This helps to understand why the composition of the Soul is done according to these proportions and not otherwise.

Metaphysical interpretations of the musical scale of the Timaeus

We have surveyed how Proclus interpreted the musical scale of the *Timaeus*, always trying to show the correspondences between different levels (Intelligible, World-Soul, sensible World, etc) and focusing on the correct way of expressing these analogies in a coherent musical scale. Let us now return to Proclus' metaphysical interpretation of the scale and its mathematical proportions. There is a section in his *Commentary* (*In Timaeum* II.207 ff.) that deals with the explanation of the composition, divisions and proportional structure of the World-Soul, from the point of view of the "reality of things" (*ta pragmata*, which for

Proclus are the more real things that belong to the Intelligible level; in this sense the explanation is *noetic*, and is an attempt to show how the objects of mathematics, numbers and musical intervals, are symbols of higher "things" or metaphysical realities).[362]

We are not going to examine the whole section; we shall concentrate on selected passages that show Proclus' views about the mathematical and musical symbolism of the *Timaeus*, together with some quotations of Porphyry and Iamblichus.

Proclus recapitulates the exposition of the harmony of the soul, but this time, everything is considered as a support or symbol for the intelligible realities that will be manifested in this way. The passage contains, however, some cosmological applications because Proclus has said that the "*skopos*" of the *Timaeus* is "to discover what the universe is composed of and how it is put together" (*In Timaeum* II.28.15). He has studied previously the composition of the body of the Universe (the elements, etc.) and how the Soul is the source of the proportion and harmony that arranges the whole as a unity in a well-ordered manner. The musical scale then, represents the whole metaphysical movement from the Intelligible to the sensible. He therefore, speaking in the manner of Pythagorean arithmologists, says:

> Accordingly the Soul contains the first principles of the harmonious procession (*enharmonios prohodos*) and reversion, and the first principles of the division into first, middle and last things [terms that he previously said were harmonized respectively by the proportions of the intervals of fifth, fourth and tone], and is a single intellectual proportion (*logos noeros*) that has been filled up with all of these ratios. Moreover it is consistent (*symphônon*) with these things that its entire harmony [scale] is a concord consisting of four octaves, a fifth and a tone. For since there is a harmony among the things in the cosmos, and among the things in Intellect, and in the Soul – because Timaeus says that it participates in harmony [*Timaeus* 36 e 7] and *is* a harmony (37a1) – the cosmos participates in harmony in the manner of the Decad. The soul, on the other hand, participates in the manner of the Tetrad, in the harmony that pre-exists (*prohyparchousês*) in the manner of the Monad in the Intellect. And just as the Monad is the cause of the Tetrad, and the Tetrad in turn is the cause of the Decad, in the same manner the Intellectual harmony (*noera harmonia*) provides it to the psychic harmony, which in turn conveys it to the harmony of the sensible realm. This is why Timaeus took the range of four octaves to be proper to the harmony of the soul: because it is a close paradigm of the harmony in the sensible realm. (*In Timaeum* II.207.18-32)

We can see here the triadic division of harmony that we have been looking at in the previous chapter (Intellect-Soul-Body of the World) and how all kinds of

[362] Cf. Proclus' *In Timaeum* II.193.5-10, about an explanation that is "*pragmateiôdês*" and note 301 in D. Baltzly's English translation of this passage. Cf. also *In Timaeum* II.213.8.

harmony depend on an intelligible Harmony. Each level of harmony is matched respectively with the Monad, the Tetrad and the Decad, in the Pythagorean tradition that combines the Decadic and the Tetradic in the *Tetraktys*. We have seen that the *Tetraktys*, which was considered the source of harmony, has a Monad on top, from where everything proceeds.[363] In the present text, the Tetradic is represented not only in the composition of the scale in tetrachords, etc. (the octave is composed of two fourths and one tone [4/3 x 4/3 x 9/8] or one fifth and one fourth [3/2 x 4/3]), but also in the four octaves that constitute the whole diagram.

In this text it is made clear that there is a *procession* of harmony comparable to a metaphysical procession from the Monad to the Decad, through the Tetrad in the middle, representing the World-Soul.[364] Proclus is in agreement with the Pythagorean conception of the *Tetraktys*, which is a symbol of the whole and the harmony that proceeds from a principle of unity on top of the hierarchy and unfolds towards the Decad.[365]

Proclus continues:

> And since there are five shapes (*schêmata*) and five 'centres' (*kentra*) in the Universe [*Timaeus* 54d 4 ff.], that make the whole complete, the musical fifth also provides the cosmos with the concord which is in its parts. And since the universe is divided into nine parts, the epogdoos [with its 9:8 ratio, the tone] creates a proportionate association (*koinônia*) between the Universe and the Soul. You can see that the Soul – in as much as it is one and a four-parted whole, and in as much as it is five-parted and divided into nine – apparently harmonises the cosmic whole and encompasses it in a preliminary causal manner (*kat' aitian*). For the Monad (1), the Tetrad (4), the Pentad (5) and the Ennead (9) provide us with the entire number in terms of which all the parts of the cosmos have been divided. […] Thus, having its middle between the Monad and the Ennead, the Universe has been elaborated "tetradically" and also "pempadically" [i.e. in the mode corresponding to five]. It has been elaborated in the tetradic manner by virtue of the four forms of living being which the paradigm [of the cosmos] includes (*Timaeus* 39e7–10). But it has been elaborated pempadically in virtue of the five shapes through which the Demiurge has arranged everything, when he introduces the fifth form [of solid figure, i.e. the dodecahedron] as Timaeus says (55c4–6), and these things are harmoniously arranged in the Universe. (*In Timaeum* II.207.32 – 208.20) (Transl. Baltzly, modified)

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[363] In the symbol of the *Tetraktys* there is a combination of triadic, tetradic and decadic; triadic because of the three levels that follow the unity on top and because its form is a triangle.

[364] Haar (1960), p. 330, gives an example of how the Neoplatonic conception of procession" or "emanation" of music continued to be influential in the Renaissance, in Ugolino of Orvieto.

[365] The first portion in the Soul, is the image, in the process of reflection that we have mentioned previously, of the Intellect (*Nous*) present in the Soul. The Tetrad is the image of the intelligible Harmony in the Soul (1,2,3,4) and the Decad that results of the sum of 1+2+3+4 is the ordering image of the whole, the harmony in the Universe. The Decad is according to Philolaus (fr. 44 B 11 Diels – Kranz, *Apud* Stobaeus *Ecl.*I *proem. Cor.* 3; see Huffman's study and quotation in (1993), p.347: "[…] great, totally perfect, and operates in everything and is principle and leader […] without this everything would be indeterminate, uncertain and not-manifested […] Number puts in harmony everything […] and makes all cognoscible and concordant […]."

Tetrad and Pempad

In the passage just quoted, we can see the combination of the tetradic with the pempadic in the arrangement of the World-Soul as the closest cause and paradigm of the order of the world. Space is arranged according to the fourfold division of the Tetrad contained as model in the Soul, with the four directions of the compass correlated by Proclus here with different "centres" of the World. He associated them also with the elements and with the five regular solids of the *Timaeus*, ascribed to the Pythagorean tradition and also to the Chaldeans. In our interpretation of Proclus' scale, there is an interval of fifth in the centre of the system, between the upper and lower double-octaves. This could express musically Proclus' idea that the interval of fifth provides the cosmos with a concord. In this case, Baltzly's translation would seem more appropriate, because it emphasises the fact that the centre serves to make the whole complete.[366] However, we modified Baltzly's translation in order to show that Proclus is taking into consideration not only the central capacity of the fifth (and other groups of five, which depend on the principle of the Pentad), but also its fiveness. Proclus mentions three groups of five components: five solids; five centres and the musical fifth (*dia pente* = an interval that covers five notes). We can confirm this interpretation because Proclus mentions "five centres", at II.107.10:

> For the life-bringing channel (*zôogonias ochetos*) proceeds up until the centre, as even the Oracles say, when speaking about the middle of the five centres which extends from up above through to the opposite side via the centre of the earth. 'And there is the fifth in the middle, another channel of fire, where the life-bearing (*zôêphorios*) fire descends as far as the material channels (*ochetos*). (Or. Chald. 65, trans. Majercik)'[367]

This text shows that both meanings are combined: the groups of five are related because being five makes them a whole through the cohesive capacity of the Pentad, and at the same time this fifth "element" or "component" has a centralizing power. Since in the first text (II.207.32), Proclus is talking about the attributes of the Pentad, and how it is the cause of harmony for the world, it is reasonable to include the five centres in the translation, mostly because they are mentioned again in the second text (II.107.10). Therefore, the musical fifth's

[366] Baltzly's tranalation of II.207.32-208.2 says: "And since there are five shapes in the universe and since the centre serves to make the whole complete, the musical fifth provides the cosmos with a concord in virtue of its parts."

[367] Proclus mentions the Intermediate nature of the soul and associates it with the pentad at *In Tim*. II.127.3: "The pentad is fitting for the soul as an intermediate, connecting the bond of the unit and the number nine." Cf. II.126.15. All these texts are connected, because 5 is in the middle between 1 and 9 as arithmetic mean.

capacity to provide harmony and concord resides in its fiveness; but because the element in the centre is the fifth one (as in the centre between the four cardinal points), the central aspect of the musical fifth should be taken into account as well. Proclus must be referring to the four cardinal directions when he depicts these "five centres". There is a harmonizing capacity at the centre of the Earth and it is projected or mirrored analogically into the four other "centres".

The fifth "component" represents the power of englobing the other elements, and this appears more clearly from the consideration of the other group of five: the Platonic solids.[368]The World-Soul possesses the double capacity of being present at the centre and at the same time covers the World from outside, as in a circle, revolving within itself (*In Timaeum* II.107.19-107.33).

Proclus mentions five "centres" in this context (*In Timaeum* II.107.5 ff); while he is commenting about the middle position of the World-Soul in the *Timaeus*. Proclus quotes the *Chaldean Oracles* to show in which way the Soul is a fountain of life and harmony. According to this symbolism, there is a main channel that brings life (*zôogonias ochetos*) and it is placed in the centre, which is identified with fire. Proclus explains that this centre (centre in relation to the other four directions) is a living symbol or a guardian power of the World-Soul (*phrourêtikê dynamis*). At the same time, he clarifies that in reality the World-Soul transcends the World and envelops it: and in this sense, rather than connecting the pempadic (the attributes of the Pentad) literally with the centre he prefers to consider it analogous to the more proper location of the World-Soul as a surrounding reality. This aspect can be symbolized with the ether that encompasses the other elements and matched with the fifth figure in the *Timaeus*. However it is important to have in mind that ether is not understood by Proclus as the Aristotelian element, but as the Ethereal sphere of the Chaldeans. [369] Proclus says then, that he prefers to

[368] See also Philolaus' notion of a Monad-Fire at the centre and a fifth component that corresponds to the sphere, which is the vehicle of the four elements: Fr.7 and Fr.12; cf. Hufmann (1993), pp. 226 ff. and 392 ff.

[369] Proclus in his *In Timaeum* II.49.26, considers the mixture of the four elements in the heavens (more pure than the sublunar elements) a fifth essence (*ousia*), but not as an element like Aristotle's ether, cf. Baltzly transl., 2007, note 39 *ad loc*. The encompassing power of the heaven (and it is implied: the Soul and its proportions, as source of its unity) is compared by Proclus (*In Timaeum* II.49.30 ff.) with the fifth body (the *dodecahedron*) that the Demiurge uses for the Whole in the *Timaeus* (55c 4 ff.; cf. Cornford (1937), p. 219). The four elements are compared to the other geometrical bodies in the preceding lines of the *Timaeus*. We have then in Plato's own depiction a clear relation between whole and parts, between the four elements and the fifth body. Cf. also the *Philebus* (29 a-e) about the unifying power of the soul and the four elements. A similar conception can be found in Philolaus, fr. 44 B 12 DK, cf. Huffman (1993), pp. 392 ff.

locate the *hegemonikon*, the directive part of the World-Soul, in the transcendence of the encompassing circle rather than in the centre of the Earth.

Plato does not mention ether as a fifth element in the *Timaeus*, he only says that it is the purest air (58d). But ether is mentioned in other dialogues, such as the *Phaedo* 109b and 111b, and the *Epinomis* 981c. In the *Timaeus* 55c 4 ff., Plato depicts the sphere of the Whole, associating it with the fifth regular solid (*dodecahedron*), without relating it to a particular element. But in the *Epinomis* the fifth body corresponds to ether.[370]

Proclus criticizes the Aristotelian conception of ether as a fifth natural element, matter of the heavens (cf. *In Timaeum* II.9.7 ff.; II.42.10 ff.; II.49.12 ff.). For Proclus the Heaven is composed primarily of fire; but this is a different kind of fire than the one found here on Earth. According to the analogical conception of reality that Proclus follows, fire —like every being—, can be found at different levels, in each one according to the proper mode of that particular level (*In Timaeum* II.44.8). Fire present on Earth, according to a partial and earthly mode; in the Heavens, according to a total and heavenly mode. In this sense, following a general principle, when a being exists according to a total (non-divided) manner and in its unitary mode is when it possesses its more essential character. For this reason the fire in the Heavens, contrary to Aristotle, exists in its natural place and acts or moves in its natural movement which is circular.[371] Fire on Earth moves in a rectilinear way, however this is not its natural movement, it moves that way because it seeks to ascend to its natural place, which corresponds to the highest regions. Therefore, the fire in the Heavens, because of its circular movement around a centre and its surrounding character, is analogous to the Soul or the *Nous* more properly; this is an immaterial fire (present in the model or Living being itself), comparable to the essence or Hestia (Hearth).

We cannot deal with this complicated theory here, but it is important to understand that Proclus' theory of divine Fire, which corresponds to a Pythagorean and Chaldean conception of Ether, is related to the notion of light as a container, identified with space (or place, which is a theory that Iamblichus

[370] The authorship of this dialogue is disputed; even Proclus does not consider it truly Platonic, because its conception of ether seems too close to Aristotle's. It is thought that the dialogue could have been written by Philip of Opus.
[371] Cf. Wildberg (1988), p. 126 ff.

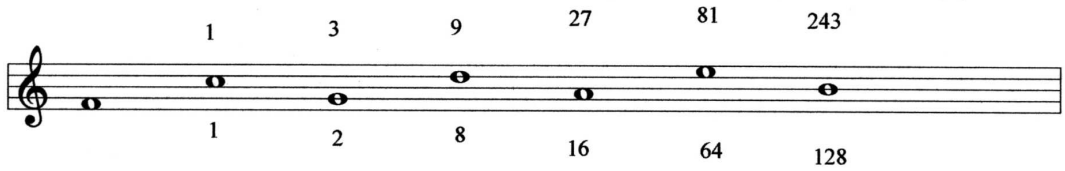
developed).[372] We mention this theory because it has important musical consequences: e.g. the picture of the Universe (derived from Plato's *Republic* and *Timaeus*, and interpreted by Proclus according to Chaldean and Pythagorean conceptions) that follows is that of a Universe full of light and sound in the Harmony of the Spheres, which is symbolized, as we shall see, by the enveloping music of Apollo's Lyre played with a ray of the Sun.[373]

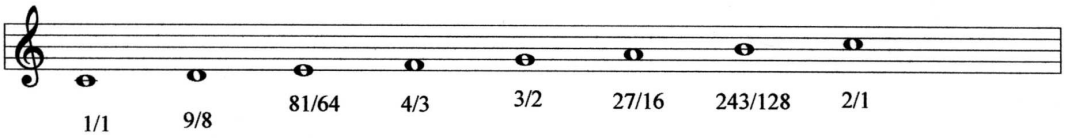
Musical symbolism can be applied according to other aspects of this theory, because the principle of cohesion, unity and harmony is related to tuning, the circle of fifths and the relation between the strings of the cosmic Lyre. The directive part of the Soul identified with Ether and the Heaven or at other times with the Sun (source of light), is represented in the unity of the ordered succession of the spheres represented in temporal terms in the days of the week arranged in a musical way. The musical note that corresponds to the Sun (and Sunday) is placed symmetrically in the middle of the other intervals of fifths that represent each note in the Harmony of the Spheres. The following diagram will help to understand the symmetry of the heptachord of the planets and the order of the seven days of the week: [374]

a	b	c	*d*	e	f	g
La	Si	Do	*Re*	Mi	Fa	Sol
Moon	Mercury	Venus	*Sun*	Mars	Jupiter	Saturn

The order of the days of the week results from a series of fifths: Monday = a, is followed by Thursday = e, which is the subsequent fifth from the note a, etc.
The Sun = d appears in the symmetrical middle of the structure based on fifths:

[372] Cf. Proclus, *In Remp*. II.188.6-190.27 and II.198.2 ff. for the notion of space (or place) as light. Cf. also II.201.10 ff. for the relation of Plato's account in the *Republic* and the three levels of the Universe according to the Chaldeans (Empyrean, Ether, Material worlds) however in this last text, "Immobile Light" is considered the container of the three levels, and the ether is the middle level. In 202.25 he says that the immobile Light moves all the other spheres, and is considered as an instrument of the World-Soul.
[373] Cf. pp. 92 ff. above and 171ff. below.
[374] See Dio Cassius quoted here on p. 65 note 152. These intervals could equally well be understood as descending fourths, rather than ascending fifths, and Dio mentions only the fourth. Another way of interpreting the scheme is to start with a note and ascend a fifth, then descend a fourth and again ascend a fifth, and proceed in the same way until covering all the days.





f	c	g	d	a	e	b
Fa	Do	Sol	Re	La	Mi	Si
Jupiter	Venus	Saturn	Sun	Moon	Mars	Mercury

Proclus' statement, quoted above (pp. 155 and 166), that the interval of fifth is the source of harmony between the parts of the universe (i.e. the spheres of the planets, the elements, etc.) can be understood better in this context.

The Sun has the central position in the Chaldean order and it is the source of light, harmony and divine life, which unifies the life of the whole that has its temporal succession in seven days. A similar symmetric arrangement can be seen in Philo and Clement of Alexandria's interpretation of the Jewish candelabrum, that associates the six branches with three planets (including the moon) on each side and the Sun in the centre; and both authors link it with a cosmic lyre of seven

strings and consider the Sun as giver of divine harmony together with light.[375] The attribution of the *mesê*, central note of the scale, to the Sun, expresses in a musical way a characteristic of the centre, which is more spiritual than literally spatial (because the centre is conveyor of a spiritual influence from the transcendent principles).[376] The spiritual quality of music makes possible this analogy because music is able to mirror the central character of the *Nous*, thanks to the harmonic arrangement of sound and its beauty, which transcends mere materiality. The musical notes are arranged symmetrically, according to proportion, in relation to the note *mesê*. In the same way, the universe is arranged around Apollo, which is the spiritual principle of the visible Helios (Sun).

In the comparison of the world with a cosmic-lyre played by Apollo, the joining element is considered the plectron, which is associated with ether by Aristides Quintilianus when he describes the syllables used for solmisation:

> […] and the letter which is attached to all these, the tau, [corresponds] to ether, since it is shaped like a plectrum, and is sacred to the god who, so wise men say, is the plectrum of the universe. Thus the letter tau is attached to all the vowels [used for solmisation], when these are associated with notes, just as the ether is attached to the other elements, and transmits to them the power of life. Thus the movement of the elements is the ordering of matter, and the ordering of the soul … is melody. (Aristides Quintilianus, III.25; 130,10, transl. Barker (1989), p.531)

Aristides associates the four vowels of solmisation (alpha, epsilon, eta and omega) with the four elements that receive cohesion with the consonant tau identified with ether, as an active ordering principle. Other sources associate the seven vowels with the seven planets, but we cannot study these analogies here.[377]

Since we have mentioned the elements, it is important to observe that when the cosmic lyre is understood as the seven-stringed lyre (Apollo or Orpheus) it is associated with the planets; however when the cosmic lyre is considered as the four-stringed lyre of Hermes, it is linked to the elements and the seasons of the year, showing different aspects of the harmony given by the musical intervals, specially the fifth. Although Aristides is referring to Apollo in this text about the elements, this passage belongs to the latter consideration of the harmony of the

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[375] Cf. Dulaey (1983). The author studies how the candelabrum is related to the days of the week.

[376] The planetary system that we are mentioning here differs from the one mentioned earlier, which contained a note representing Heaven. This system is a heptachord and spans a seventh (seven notes), like that of Nicomachus *Harm.* 3. The note *mesê* is located symmetrically in the middle o the system of seven notes, which can correspond to the tetrachords *meson* and *synemmenon* of the Greek musical writers; see Barker (1989), pp. 11-13 and p.97, note 76. The *mesê* of the planets has a central position in this system made of two conjoined tetrachords but not in the octachord octave.

[377] Cf. Touliatos (1989) and Haar (1960), p. 213, ff.

seasons, that he has explained previously (III.19 ff.; 118.29; Barker, p.519 ff.) including correspondences with musical notes, the elements and the regular solids.[378] He summarizes this conception that he attributes to Pythagoras[379] with the following remark, which is very close to Proclus' account (*In Timaeum* II.207.20 – 208.20) that we are commenting on here:

> There is also, then, a clear paradigm of music in the body of the universe. For the fourth, once again, displays the *tetraktys* of matter, the fifth indicates the additional body, ether, and the octave the melodious movement of the planets… (Aristides Quintilianus, III.20, 119,21; transl. Barker (1989), p.519).

Another statement in Aristides is related to Proclus' Pythagorean views and this is III.12; 112.14:

> All the numbers to do with music are sacred and of perfect efficacy (*telesiourgoi*). Thus the number 9 displays the *harmonia* of the universe (since there are seven planets, the zodiac making eight, and the so-called 'starless sphere' making nine). (transl. Barker (1989), p. 513)

As Barker explains (1989, note 117), the 'starless sphere' is that of the surrounding ether. The Sun travels through the Zodiac and in this sense when the Sun reaches its highest points in the Tropics, it symbolizes the transcendent Sun (Apollo) over the top of the surrounding Ether, and indicates the Gates (mentioned above, pp. 96-97) that communicate to the outer regions of the Universe and also marks the position of the "centres" (mentioned by Proclus after the Chaldeans) because the path of the Sun is projected on the Earth. The Tropics and the Solstices are correlated as well with the four directions of the compass and with the seasons, and all this symbolism of space is —as can be seen in Proclus' and

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[378] Aristides (III.19) associates numbers, elements and seasons (these numbers are 8; 4; 6, and 12). Since the solmisation letters refer to notes in a single tetrachord, these letters cannot be linked to the number-season-elements correspondence, because the numbers span more than one tetrachord. Nevertheless, we are mentioning these different theories to show in which way a different symbolism can be applied to the musical notes: in this case the symbolism of the elements, which in one case is related to the seasons and in another is connected to the letters of solmisation.
Regarding the allusion to Apollo in a text about the harmony of the four elements instead of Hermes, we can say that the harmonizing activity of both gods is related, especially regarding the lyre, because Hermes invented it (the tortoise-shell lyre) and offered it to his brother Apollo (see *Homeric Hymn to Hermes*, 4). On Hermes, the lyre, the four elements and the seasons, see Burker (1972) p. 355-356 and Diodorus, *Hist*.I.16.1.

[379] We have seen that Plutarch ascribes the theory to the Chaldeans, *De Anim procr*. 1028 f. Aristides Quintilianus' analogy is more complete because he presents correspondences between the five elements, the five senses and five tetrachords (chapter 14) and three intervals of fifths (or pentachords; chapter 15) in III.14-15 (113.15, Barker (1989), p. 514 ff.). Cf. Haar (1960), p.154 ff. for an explanation of Aristides' harmony of 4-8-12-6 as features of the four regular solids associated with the seasons. It is interesting to notice that the five tetrachords correspond to the elements culminating with the ether linked to the *hyperbolaiôn*, because it is the highest; cf. Barker (1989), p.515 and Haar (1960), p.336. This is in concordance with Proclus, Cicero and Boethius choosing the highest sounds for the highest levels in the universe.

Porphyry's quotations of Numenius—,[380] a metaphysical geography and chronology that guides the particular souls in their liberation from the contingencies of space and time proper to life on Earth, which is also one of the aims of music and its symbolic power.

We are dealing with this explanation in detail because it helps to understand how in this analogical theory, the interval of fifth is understood in relation to a power of the Soul that concentrates all things and is cause of conversion, as Proclus says in *In Timaeum* II. 222.29 (quoted above in pp. 111-112).[381] Accordingly the interval of fifth is an important musical expression of the metaphysical concept of conversion and of the encompassing power of the spiritual.

In music, the interval of fifth makes the musical scale return and gives circularity to the octaves, as we have mentioned before (see p.46 ff. above). Conversion is understood as double by Proclus (*El.Theol*. Prop. 37 ff. and Prop.158): a) as concentration towards each being's own centre, and from there, as from a spark or mark (*synthêma*) of the transcendent, starts b) conversion as the vertical ascent through the levels of being (for that reason in mythical depictions of the ascent of the soul, first the centre of the Earth is reached, and then the ascent follows).[382]

Ether is mentioned in many Orphic-Pythagorean texts as the divine particle in the soul (e.g. Diogenes Laertius, *Life of Pythagoras*, etc.) that makes it akin to the divine and inspires its longing to return to its origin. In many representations from Antiquity to Leibniz's frontispiece of *De Arte Combinatoria*, this theory is illustrated with the four elements (and directions of the space) in each quadrant and the ether in a central position (usually symbolized with a rose of five petals).[383]

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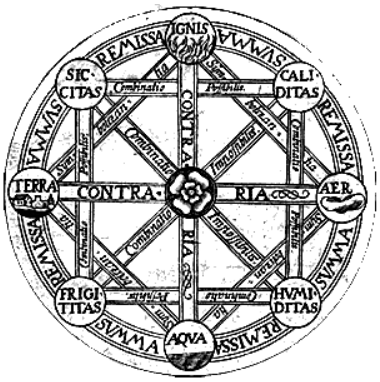
[380] Cf. Proclus, *In Remp*. II.129.1-29; Numenius fr.32; Porphyry, *De Antro*.26.8.11 (the "Gates of the Sun" are the tropics of Cancer and Capricorn) and Macrobius, *in. s. Sc*. I.12, 1. Cf. Festugière note *ad loc*. in his translation of Proclus (p.72, Vol.III). Cf. also Proclus, *In Timaeum* II.269.20 and Baltzly's note 557, p.212.

[381] On the convertive character of the interval of fifth see pp. 46 ff. and 111 ff. above.

[382] This is depicted not only in mythical texts, such as Plato's *Republic*, but also in different religions' sacred books, even in literature, from the *Aeneid* to Dante's *Divine Comedy*.

[383] The University of London shield is similar to Leibniz' diagram; it consists of the cross of Saint George with the five petals of a Tudor Rose in the centre. It is interesting to note that the cross of Saint George corresponds according to Dante (*Banquet* and *Divina Comedia*), to the crusaders and to the sphere of Mars, which is the fifth sphere from the Earth. The crown, besides the obvious meaning relating to the monarchy, also means both the central and high position of the ether. Another heraldic symbol is the rose-en-soleil, a white rose surrounded by rays, showing the light-ether connection more clearly, which also is shown in the University of London shield.



Dissertatio de arte combinatoria, Frankfurt 1690, Paris, BnF[384]

It is not surprising then to find in Proclus' text quoted above (pp. 155 and 166) that the consonance of fifth "provides the cosmos with the concord which is in its parts"; and although Proclus identifies the centre with a divine fire following the Chaldeans, in the following tradition, perhaps after the Orphic-Pythagorean version, it was identified with the fifth element understood as Ether in the higher sense explained above.

This conception of the relation between the tetradic and the pempadic as a unifying aspect, which originates from Pythagoreanism, has been influential in musical symbolism through the centuries to the point that the Renaissance violin makers designed instruments with four strings tuned in intervals of fifths,which is a clear example of the symbolism of the tetradic order of the parts of the World (elements, directions of the compass, seasons, etc.) that reach their unity in a pempadic stage through the binding agency of the Fifth element.[385] We can give two examples of how these ideas were transmitted in connection to cosmic music; one is the medieval Islamic encyclopaedia known as "*Rasa'il* Ikhwan al-Safa' (*Epistles of the Brethren of Purity*)" that clearly correlates each string of the Lute

[384] http://classes.bnf.fr/dossitsm/gc188-30.htm

[385] Although there are musical explanations and practical reasons for adopting an accordatura in *fifths*, this does not prevent the simultaneous application of symbolism (in the same way that one can live in a building that represents the universe due to its ornamentation with different symbolic designs). For example, the Arabic *'ūd* had coloured strings that represented different cosmological and microcosmic meanings (the four strings = four elements or humours; also when a string was added to the other four, its colour was red, symbolizing the soul, and was inserted in the middle, for no apparent practical reason. See Wright (1992), p. 558 (where the author mentions Ziryāb and Al-Kindī). Although Zarlino does not mention the accordatura in fifths, he does mention a harmonization of the elements according to the interval of fifth in *Le Inst.Harm*. I.14, published in 1558. We cannot present this as textual evidence for the practice of tuning an instrument, but we can say that the design and tuning of western musical instruments could be the result of a similar symbolic way of thinking. Zarlino mentions the cosmic symbolism of the strings in *Le Inst.Harm*. I.6.

(*'ūd*) with one element, and explains how their particular vibration has an effect in the body and the soul of the listener.[386] The authors also divide the day into four quarters and mention that each part has its particular sound or melodies.[387]

Another example of the link between the stringed instruments of the Renaissance with cosmic musical symbolism can be seen in a symbolic connection mentioned by the Swiss humanist Henricus Glareanus (*Dodekachordon*, published in Basel, 1547; contemporary of the Italian luthiers) who stated that the Lyre invented by Hermes had three strings, that corresponded to three seasons Summer, Spring and Winter and Orpheus added a fourth string for the Autumn.[388] Glareanus is following a long tradition that is clearly stated in Boethius' definition of *Musica Mundana* (*De inst.mus*. I.ii, 187.20 ff. F.) where he explains that cosmic music is not only the planetary harmony but also the cause of the "joining of the elements and the variety of the seasons".

Boethius states also, saying that he follows Nicomachus, that Hermes invented the Lyre with four strings "in imitation of *musica mundana*, which is made up of the four elements" (*Inst.Mus*. I.xx, 206 F.)[389]

We have seen the same conception in Aristides Quintilianus and his account of the unifying power of the light of the Sun (giving unity to the seasons) symbolized with the plectrum of the lyre. This association is older than Aristides and can be found in Plutarch *De Pyth.Orac*. 402 a and Cleanthes (SVF vol. I, 499, 502) where the plectrum is considered to be a ray of the Sun.[390]

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[386] Cf. also Adamson (2007), p.173, about the correspondences in Al-Kindī, between the strings of the *'ūd* and "the four seasons, the quarters of the heavens and of the Zodiac, the elements, the humors of the body, the phases of the moon, the directions of the winds, the ages of man and several psychic and bodily faculties".

[387] Godwin (1993), pp.112 ff. includes an extract of the *Epistle on Music* (that belongs to this *Encyclopaedia*) on this topic. Cf. also the translation used by Godwin: Shiloah (1978).

[388] Cf. Joscelyn Godwin, (1993), p. 198. We are not claiming that the four-stringed lyres are the antecedent of the design of the violin and its predecessors (rebec, lira da braccio, viols, etc.). We are only pointing out the importance of the interval of fifth for the *accordatura* of stringed instruments and its relation with the Lyre of Hermes and Orpheus. The accordatura of the violin and its particular form was designed symbolically in a milieu with a noticeable Neoplatonic and Neopythagorean influence, which was important as a theoretical background for a craft like luthiery that includes the study of proportion. We don't know exactly what kind of instrument George Gemistos "Plethon" and Marsilio Ficino used to accompany themselves when singing Orphic Hymns, but their example was essential for the following tradition. It is believed that it was a "lira da braccio".

[389] Cf. Haar (1960), p. 174 and p.168. This author studies the antecedents of the theory of the harmony of the seasons in Plutarch's version, in Aristides Quintilianus and Macrobius, cf.p. 154. He quotes (in note 244) Sachs' report of the Chinese analogy of seasons with consonances a fifth apart that is remarkably similar to the Greek version: cf. Sachs (1943), p.109-110.

[390] Cf. Barker (1989), p. 531, note 220 and Haar (1960), p.156. Plutarch tells us that the Megarians dedicated a golden plectrum to Apollo, inspired by the verses of Scythinus depicting the lyre and the solar plectrum of Apollo.

We have seen that Proclus reports a triadic division of the world in the cosmology of the Chaldeans that comprises the Empyrean, the Ethereal and the Material. It can be added that the mediating function of ether in cosmology is reflected in the musical theory of the interval of fifth as mediating and connecting the musical notes (or strings).

In Proclus' particular interpretation (following Orphic, Pythagorean and Chaldean sources) the fifth element is more a spiritual reality, which represents the illumination of the *Nous* in the Soul, rather than a material element as in Aristotelianism. This is illustrated in the example of Renaissance instruments like the violin in the fact that tuning and harmony are not visible qualities and the visible aspect of the instrument shows four strings but music and melody come from the four together, having in mind also that since Aristides Quintilianus string instruments were believed to put in movement the ether and not the humid air like wind instruments.

Another influence of these doctrines can be found in Beethoven, who expressed in music this conception of ether as a reality that surrounds the canopy of the heaven with an ethereal music (mainly with strings and voices) in a section of the last movement of the *Ninth Symphony*.

As we shall see in the next chapter this is very important as one of the effects of music in the return of the soul through inspiration, that shows the binding power of the spiritual (*noetic*) that transcends the spatial and the succession of time, and puts the souls that listen to it back in their own true country of origin[391].

In the concept of *accordatura* of an instrument, the problem is one of unity and cohesion, and how to make a whole out of parts; showing that harmony is a question of tensions (as Heraclitus said). This invisible harmony depends ultimately on the *Nous*; the Soul extends itself (in time and space; and as a source of the sciences of arithmetic, music, geometry and astronomy) and expands, analogically, as the element of air; but the *Nous* illuminates as fire and ether (illuminated air), which contains and envelops.

Proclus explains the notions of "extension" as the intermediary capacity that expands from the middle and "covering" as the more transcendent and unifying life of the Soul. Both aspects are associated in the musical space respectively

[391] Romantic poets such as Novalis have expressed this quality of music, see Bowie (2003) p. 96.

with the octaves that expand the sound, and the fifths that come back in a circle (as we shall see later in Iamblichus).[392]

Proclus states in II.108.20-30:

> Thus, since the process of ensoulment in this text is twofold – in one sense from the Demiurge and in another sense from the self-moving capacity of the soul – Plato has naturally honoured the cause that is in accordance with the divine [before the other one] as most appropriate to the [discourse concerning] wholes. For 'placing', 'extending' and 'covering' are words that connote Demiurgic activities. The first signifies the final level of the soul. The second term corresponds to its [stretching from the middle] pervading everything. But the final term signifies its transcendent superiority, for 'covering' indicates the fact that the soul encompasses the cosmos and through itself unifies it and introduces a single life. It leaves nothing [that is] outside its own proper providence or deprived of itself.

The same doctrine is expressed musically in the text of Proclus that we are discussing (i.e. *In Timaeum* II.207.18 ff.), quoted above (p. 165). All the divisions of the World and of the Soul, which are expressed as well as musical intervals, are reunited in a Whole through the containing power of the octaves and the fifths. Since the demiurgic activity and the process of ensoulment is combined with the self-moving capacity of the Soul, conversely the return will need both activities again, the self-moving return of the Soul towards itself (concentration) and the vertical orientation to the Demiurge as its cause beyond the starry sphere that envelops everything (ascent). Hence the importance of contemplating the universe in a musical way, for the particular soul in its return. For the soul can see in the Macrocosmos the musical scale that marks the returning path (although it has at the same time all the levels and musical harmonies inside itself). We shall see how the musical cosmic scale shows the way to the ascent with the assistance of the Harmony of the Spheres and also the concentrating power or effect of music in concentrating the soul towards itself. Music, as a means of education since childhood (cf. Plato's *Republic*), develops both the self-moving capacity of the soul and also a unitive love of the objective beauty through a frequentation of beauty and a spontaneous attachment to it, which is unitive because beauty kindles the spark (= fire) of the *Nous*, in the heart (= Sun) and it is more than rational, because the rational is only separative and expansive (= air = Moon).[393]

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[392] Cf. Marsilio Ficino, *A letter concerning Music*, quoted in Godwin (1993), p.165, where he explains the musical octave as rising from the lowest note to the highest, but in a way in which the fifth is "the culmination of the rising movement; while the notes that follow the fifth are held by the followers of Pythagoras not so much to rise as to return toward the earlier ones".

[393] For this reason, as Iamblichus says in his *Life of Pythagoras* 25, Pythagoras did not persuade the drunk young man with reasons but by suggesting a change in the musical scale; showing that music has a more spontaneous and unifying effect in the soul's *thymos* than reason that only enhances self assertion and has not the same power as a means of agreement. I owe this important

In order to summarize this theory we can say that the principle of unification expressed with the notion of harmony is represented in the central position from where the joining activity of the transcendent principles that envelop the sensible are diffused, and it is symbolized with the middle note (*meson*) or with a fifth substance identified with light (ether, Sun ray, plectrum of Apollo). This joining capacity is as well symbolized with the returning circle of the intervals of fifth, hence the tuning of string instruments is a good representation of the invisible cohesion of all the parts of the universe that correspond to the different musical notes.

The microcosmic connotations of this theory can be seen in the fact that music is not intended only for the sensible ears, because there is a unifying centre of perception (where sounds and music travel to), located in the ethereal body that surrounds the physical body made of elements. In this sense, when we listen to music the soul is unified with the vibration of the ethereal body. This is specially said about Pythagoras hearing the harmony of the spheres with the ethereal vehicle, and in this way sensible music is an imitation of that higher music that sounds in the ethereal world.[394]

We have tried to show in our own way of writing how this analogical theory works, trying to use the analogy of the three levels of the Chaldeans understood by Proclus as: *Nous* = Empyrean (Fire); Soul = Ethereal (the intermediary level of high illuminated air); Material = Sublunar world; where the sky (*hypouranios*) shows the limit of air. In this scheme, music as a typical ethereal reality is the vehicle for the sonorous illumination of the noetic fire on the air of the human composite being (hearing engages all these elements; fire, ether and air).[395]

The ratio 9/8

We have commented on Proclus' text regarding the relation between the tetradic and the pempadic in the constitution of the musical scale out of four octaves + a fifth. In addition to that we need to include the tone that is needed to

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point to a remark by Kostas Kalimtzis and also to his paper "Nurturing the *thymos*", read at the Hellenic Institute Colloquium, London, June 2008.

[394] Cf. O'Meara (2007), p.154, who quotes Iamblichus, *In Timaeum* fr. 84 Dillon, and other sources.

[395] Cf. Marsilio Ficino's selections in Godwin (1986), pp. 118 ff. on similar associations, e.g. Apollo, sound (and middle region), the influence of music on the heart, etc. Cf. in particular Godwin's quotation (p. 318) of Ficino's *Commentary on the Timaeus* ch. 28 about the elements that take part in audition.

complete the scale of the *Timaeus* from 1 to 27. Proclus explains, in the passage quoted above (II.207.18 ff.), that because the tone is in the ratio 9/8, both numbers represent cosmic correspondences between the different parts of the Universe. The musical symbolism is understood, not as an artificial or arbitrary human convention —Proclus does not say that Plato chose to say in a metaphorical way how the order of the parts of the world is arranged—, on the contrary, these musical proportions correspond to Demiurgic numbers. The symbol is an evocation of a real characteristic in the World-Soul that contains the order of the parts, which itself mirrors the harmony of the Intellect as a symbol. Accordingly, "symbol" means something that evokes the creative illumination of the Intellect and the connecting process which can also be called symbolization,[396] through which the World-Soul gives unity to the derived realities. The musical symbol shows in a living way a real relation of unification between the sensible and the Intelligible, and the relation between the World and the World-Soul, which is the intermediate principle that connects everything to its source in the Intellect. We can quote Proclus' text again thoroughly:

> And since there are five shapes (*schêmata*) and five 'centres' (*kentra*) in the Universe [*Timaeus* 54d 4 ff.], that make the whole complete, the musical fifth also provides the cosmos with the concord which is in its parts. And since the universe is divided into nine parts, the epogdoos [with its 9:8 ratio, the tone] creates a proportionate association (*koinônia*) between the Universe and the Soul. You can see that the Soul – in as much as it is one and a four-parted whole, and in as much as it is five-parted and divided into nine – apparently harmonises the cosmic whole and encompasses it in a preliminary causal manner (*kat' aitian*). For the Monad (1), the Tetrad (4), the Pentad (5) and the Ennead (9) provide us with the entire number in terms of which all the parts of the cosmos have been divided. It was for this reason that the ancients set the Muses and the Apollonian Conductor (*Apollon Musagetes*) to rule over the universe. The latter conducting the chorus provides a single unification of the entire harmony while the former hold together its divided procession and bring their own number into harmony [singing together] with the eight Sirens in the *Republic* (X 617b 4-7).Thus, having its middle between the Monad and the Ennead, the Universe has been elaborated "tetradically" and also "pempadically" [i.e. in the mode corresponding to five]. It has been elaborated in the tetradic manner by virtue of the four forms of living being which the paradigm [of the cosmos] includes (*Timaeus* 39e7–10). But it has been elaborated pempadically in virtue of the five shapes through which the Demiurge has arranged everything, when he introduces the fifth form [of solid figure, i.e. the dodecahedron] as Timaeus says (55c4–6), and these things are harmoniously arranged in the Universe. (*In Timaeum* II.207.32 – 208.20)

The World-Soul encompasses the whole World in a causal mode with the harmony of its intervals. In this sense the music of the Soul is the cause of the division of the World in specific parts. All the numbers mentioned by Proclus add

[396] The word "symbol" comes from the Greek "*sym – ballein*", which means "to reunite" and "to compose".

up to 27 (the last number of Plato's progression): 1 + 4 + 5 + 9 + 8 = 27. They are not only numbers; they correspond to metaphysical principles, as we have seen concerning the relation between the pempad and the tetrad. The Monad corresponds to Apollo who is the transcendent cause of Harmony, and the Muses and the Sirens manifest in their harmonic relation the proportion between 9 and 8 (which is the ratio of the tone). In the *Republic*, the Sirens represent the Harmony of the Spheres; here Proclus explains that this sensible Harmony is contained in a causal way in the intelligible Harmony of the Muses, who in turn are harmonized by Apollo in the centre as conductor of their music and dance. We can see again in this scheme the procession of harmony from the Unity to the sensible, passing through the levels of Intelligible and World-Soul harmony.

Apollo is the representative of the Unity as an Intelligible Sun and "non multiple" (A-pollon).[397] The choir of the Muses unified by Apollo is the source of the Harmony of the eight Sirens, which preside over the spheres of the World.[398]

In this text Proclus says that the nine Muses lead over the eight Sirens, unifying the procession of harmony.[399] It can be noticed that the harmony of the eight notes of the planetary octave is composed by a fourth and a fifth (3/2 x 4/3 = 2/1), showing again the relation between 4+5, that is 9, the number of the Muses. The whole diagram of the spheres in the *Republic* is based on a implicit harmony arranged in symmetrical combinations that add up to 9 in different ways and in the relation between the fourth and the fifth, as in the order of the week too.[400]

The ratio 9/8 shows the relation between the World and its Soul, because the spheres are eight and the whole corresponds to 9, and the Soul that contains everything.

In this context, Proclus' phrase "the Universe has its middle between the monad and the ennead" becomes clearer. Especially when compared with *In Timaeum* II.127.2, which gives us the key to interpreting it:

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[397] Cf. Plotinus, *Enn*.,V, 5, 6; Plutarch, *Moralia*, 393 C; 388 F and Clement of Alexandria, *Strom*. I.164.

[398] See note 318 above.

[399] On the relation between Muses and Sirens cf. Proclus, *In Timaeum* II 208, *In Remp.* II, 237 – 239, and Festugière note *ad loc*. in his translation (note 6, p.195). Cf. also Macrobius, *In Somn. Scip.* II, 3.

[400] Cf. pp. 65 ff. above. Although the days of the week are associated with a planetary heptachord, and not the octave mentioned here (the heptachord spans two fourths, not a fourth and a fifth); the musical scheme of the days, which is based on a "motion by leaps" indicated by a descending fourth or an ascending fifth, can be compared to the scheme of the eight spheres in the *Republic*, which correspond to eight notes (because Plato includes the sphere of the fixed stars) that can be ordered in symmetrical patterns according to the bibliography quoted in note 151 above.

> The pentad is fitting for the soul as an intermediate, connecting the bond of the unit and the number nine, just as the soul itself connects the intelligible and sensible realms. Arranging things in this manner, we shall divide the entire theory of the soul into five headings: in the first instance, speaking about the essence of the soul; in the second about the ratios and harmonies in it; third about its shape (*idea*); fourth about the many powers in it; and fifth about its activities.

We find again the middle term related to the pempad in the relation between 5 + 4 = 9 and in the context of the World-Soul as intermediate and binding principle. Proclus indicates that the arithmetic mean between 1 and 9 is 5.[401] This is represented with the fifth element, the ethereal level of the Chaldeans and the interval of fifth. It is not by chance that the pentagram or pentalpha was a sacred symbol for the Pythagoreans.

It has been the purpose of this section to show how for Proclus the source of the harmony of the world is found in the harmony of the soul, which in turn proceeds from the intelligible Harmony by means of proportion that depends on numeric principles, such as monad, tetrad, pempad, ogdoad, ennead, decad, etc. In this sense the World-Soul contains in a causal mode (paradigmatically) the whole World, because it is the closest model for the harmony of the World. [402] The World-Soul in turn has its model in the harmony of the Intellect symbolized, in a Pythagorean way, with arithmological paradigms or ratios. We can say then, that the World-Soul contains in a *symbolic* way the musical intervals that give order to the World (as paradigm) and the intelligible Harmony (as image).[403]

Different metaphysical exegeses of the scale of the Timaeus (Porphyry and Iamblichus)

a) Porphyry

Further on in his *Commentary* (II.213.8 ff.), Proclus presents different exegeses of the harmonic composition of the World-Soul, according to Amelius, Porphyry, Iamblichus, Theodorus and Syrianus (Proclus' teacher). Proclus says that these interpretations follow the real nature of things (*pragmateiôdês*). We will concentrate on Porphyry and Iamblichus.

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[401] Between 1 and 5 there is 4 and the same between 5 and 9. Cf. Baltzly note ad loc. p. 35.

[402] On this conception of causality cf. Proclus' interpretation of the *Philebus* (*In Timaeum* I 406, 30 – 407, 20), understanding that the Intellect contains in a causal mode the Soul; the same can be applied to the relation Soul-body. Cf. also a study of the relation between the Intellect as Demiurge and the World-Soul, and the relation between archetypal or paradigmatic causality and efficient causality in Neoplatonism, in contrast to Aristotle's conception, in Steel (1987). Cf. also the bibliography quoted in Sorabji (1983), pp. 443-444.

[403] "Symbolic" is understood in the sense explained in p.180 above.

According to Proclus, Porphyry considers the Soul as a harmonized reality that fills the world with harmony. Since the Soul is a multiplicity it has to be a harmonized multiplicity, because it is the result of the creation of the Intellect and also because we can see that encosmic things (which are multiple) are directed in accordance with harmonic proportions.

We can see this, both in the particular processes of generation of living beings and in the unity of their single order in relation to the Whole. Proclus will expand this conception putting emphasis on the fact that the Soul has harmony as an image of the Intellect and also that the harmony that we see in the physical world has its paradigm in the Soul's harmony.

Proclus continues presenting Porphyry's position:

> But how these ratios are defined in terms of the soul's very hypostasis, he neither teaches us nor sees fit to attend to. But the essence (*ousia*) of the soul has been declared to have these harmonic ratios in itself – not as images of other things, nor as first principles of something else – but as something that binds together the plurality of powers in it. For if it really is not only indivisible, but also divisible, then it is equally necessary that its Being (*ousia*) be not only single, but also one that has been pluralised. But if it has been pluralised, then it is either numberless or counted by some definite number. But it is impossible for it to be without number, for a numberless plurality is without order. So therefore it has been numbered. But if it is numbered, then it is either composed from parts that are harmonious or those that are inharmonious. But it is impossible for it to be composed from inharmonious parts, for nothing of this sort possesses being in a way that is natural. Therefore it is composed from parts that are entirely harmonious. But if it is composed from parts that are entirely harmonious, it is necessary that it exists in accordance with the best harmony – if indeed, it is the first of the things that are harmonised. But the best harmony is that which exists in accordance with the diatonic genus, for this is dignified and strong. Thanks to this fact, then, the soul is entirely harmonised, with the result that its essence would be composed of parts in accordance with the diatonic genus. (*In Timaeum* II.214.25 – 30).[404]

Proclus agrees with Porphyry in his analysis of the Soul as a plurality that is numbered, harmonized according to number and ratio, composed of harmonized parts. But it seems that for Proclus, Porphyry's position —even though it follows a neat logical argument that depicts the level of the Soul in itself and its harmony— is too immanentist (too Aristotelian) and rational.[405] The depiction is correct, especially the attribution of the diatonic genus to the Soul, but for Proclus although this is true, nothing prevents us from transcending this level of language and seeing that the harmonic ratios are images of more divine realities. We do not have to stay only at the rational and scientific level alone, but we can seek the

[404] The scale of the *Timaeus* proposed by Proclus is also in the diatonic genus. Cf. Taylor, A.E. (1928), p. 143.

[405] Porphyry's account refers to the proper level of the Soul (*dianoia*) and its faculties, as harmonized in itself, without considering in all its scope the fact that the mathematical proportions of the Soul and its order can be, in the Pythagorean way of mathematical symbolism, an image of a reality that surpass the Soul's order and level, because it is their cause.

metaphysical meaning in these facts, which are evoked, symbolized in the harmony of the Soul. In order to do that, we need to follow a noetic interpretation of the text such as that proposed by Iamblichus.

> But nothing prevents this being true while at the same time the harmonic ratios are images of certain divine things, as in the case where the body of the world is a sphere, but this is because the spherical shape is said to be an imitation of Intellect. These things entail one another. These things that Porphyry says at least afford us the opportunity to draw some true conclusion about the soul. (*In Timaeum* II.215.1-5)

For Proclus, the World-Soul really has an analogical and symbolic character, and also the World. Iamblichus pays more attention to this aspect of imitation between copy and model at every level and what is more important for our topic is that for Iamblichus the metaphysical analogy can be expressed in a musical language, following Pythagorean ideas.

b) The symbolic interpretation of Iamblichus

Proclus does not deny the more literal analysis of Porphyry; it is metaphysical (*pragmateiôdês*)[406] in the sense of being a study of the essence of the Soul but it is not metaphysical in the whole range of the word as is the case with Iamblichus' spiritual (*noetic*) study that links the Soul with the divine Intellect through Pythagorean analogies. Symbolism surpasses the rational and discursive meaning of texts and gives an intuitive perception of the nature of the Soul and its scale based on demiurgic numbers:

> The divine Iamblichus celebrates these numbers with all his power[407] as things with the causal efficacy to bring about certain wonderous properties. He denominates the monad [1] as a cause of sameness and unification, while the dyad [2] is able to provide for procession and differentiation. The triad [3] is such as to originate the reversion (*epistrophe*) of things that have proceeded. The tetrad [4], in turn, is genuinely pan-harmonious, since it includes within itself all the ratios and exhibits within itself a secondary cosmic order. The ennead [9] is productive of true realization (*teleiôsis*, perfection) and of similarity, since it is completely composed from complete parts [3 x 3 = 9] and participates in the nature of the Same. The ogdoad [8] he calls the cause of procession to all things and progression through all things. It remains for the eikosiheptad [27] to be such as to produce the reversion of even the last of the things [that have proceeded], so that on each side of the tetrad [4] there might be [a causal influence that corresponds to] remaining, procession and reversion – in the first case [i.e. in 1–3] it exists in a primary way, but in the other case in a secondary way. For the 9 has a kinship (*syngeneia*) with the monad, since it is a 'new one'. The 8 corresponds to the dyad, since it is a cube from it [2 x 2 x 2], and 27 corresponds to the triad for a similar reason [3 x 3 x 3]. Through the prior [set of correspondences], he grants to the simpler beings [a capacity for] remaining [in the cause], proceeding [from the cause], and reverting [upon the cause], but through the secondary corrrespondences he also grants them to the things that are more composite. The 4 is a mean, which is explained by the fact that, since it has four sides, it has the [stable] characteristic of remaining. But because it is an even times even number, it has the characteristic of proceeding. And then, because it has

[406] See pp. 182 and 164 above.

[407] Baltzly's translation "with all his power" seems to refer to Iamblichus, however "*meta pasês dynameôs*" could mean to celebrate the numbers in all their power.

been filled with all the *logoi* coming from the monad, it has the characteristic of reverting. These are symbols (*symbola*) of divine and ineffable things. (*In Timaeum* II.215. 5 - 215. 29)

Discursive reason alone is not able to attain this kind of symbolism. The unity of intellectual vision is necessary in order to contemplate the proportional unity of the World and the Soul in a single symbol. Music —when it is in kinship with the Intelligible— surpasses mere rationality and presents a single sonorous symbol, a harmonious unity, through evocation.

Therefore, Iamblichus says that these are ineffable things (*aporrhêta*) for the language of reason. These symbols produce in the soul a return to its monadic portion, source of stability.

In order to understand this fragment of Iamblichus quoted by Proclus, it is necessary to take into account two Neoplatonic doctrines of metaphysical character:

a) the conception —of Pythagorean origin— of "limit" (*peras*) and "unlimited" (*apeiron*) as principles of the cosmos, subordinated to Unity[408] and b) the famous theory of the metaphysical cycle: *mone*, *prohodos* and *epistrophe*.[409]

Both aspects are interrelated in Proclus' philosophy, because the One, the unlimited (dyad) and the limit (monad) correspond to the triad "permanence, procession and return" [or remaining, procession and reversion]; and are related as well to the triad "Being, Life and Intellect".[410]

Hen	Permanence	Being
Apeiria	Procession	Life
Peras	Return	Intellect

The arithmetical connotations of these correspondences can be expressed according to the ideal principles of the numeric progression 1-2-3 (and the

[408] Both Syrianus and Proclus identify the principles of limit and unlimited that appear in Plato's *Philebus* 17 a ff. with the Pythagorean monad and dyad. Cf. Sheppard (1982) and O'Meara (1989), p. 206 ff. The primacy of the One is attributed to the Pythagoreans by Eudorus quoted by Simplicius, *In Phys*. I, 181.7 ff. (Diels), and in Alexander Polyhistor (Diog.Laert.,*V.P.* VIII, 24). Cf. A. J. Festugière (1954a), Chapt. II: "L'Un transcendant aux nombres". Festugière quotes Eudorus, Philo of Alexandria and Iamblichus *ap.* Damascius *De Princ.* I p. 86.20 (Ruelle). On Plato's doctrine of the principles see H.J. Krämer (1990) and Reale's introduction (pp. 24 – 27) to the Italian translation of Merlan (1968), where he considers versions of monistic and dualistic Platonism.

[409] On this triad see Proclus' *Elements of Theology*, Prop. 25 ff (Dodds' transl. pp.29 ff.) and Gersh (1973), Chapter 3, pp. 49 ff.

[410] Cf. Proclus, *Platonic Theology*, III, 8 – 12 and Propositions 87 – 96 of the *Elements of Theology* on the relation between Being, Limit and Unlimited. Cf. Beierwaltes (1979).

subsequent duple and triple progressions) mentioned by Iamblichus/Proclus: Monad-Dyad-Triad. The Monad reflects the One (*Hen*), the Dyad corresponds to the distinction of the pair *peras* and *apeiron* (principles of number in Pythagoreanism); however, because of being a principle of division the Dyad also corresponds to *apeiron* and progression. The Triad, or third term is the "*mikton*", (according to the *Philebus* 23c ff.) the mix of both (*peras* and *apeiron*), then it is a product of 1 + 2 and in this sense it is a third (3) term. Accordingly, the level of being is the result of a combination of monad and dyad, and it is then a triadic structure made of being, life and intellect. In this sense the Intellectual level is a reality begotten by the monad and the dyad as father-like (*patrikês*) and mother-like (*matrikês*) principles; and the third is the offspring. In relation to the scale, the third term (the Triad) is provider of return and perfection. The Monad-Dyad and Triad are intelligible principles, however on the other hand, they are reflected on the World-Soul as components of its harmony, because they mirror the complementary principles *Peras* and *Apeiron*, which are presided over by a transcendent One as the non-dual source of duality. These principles that are beyond being are reflected in a demiurgic Monad and a zoogonic Dyad (life-giving or generative), while the Triad is considered "perfective".[411] Iamblichus is already applying similar vocabulary and concepts in his analysis of the numbers of the *Timaeus* (and Proclus follows him in this), as can be seen very clearly, for example in the fact that number 9 is "perfective" because it is the square of 3.

At the same time, these principles have an arithmetical and musical expression, because the harmony of sounds is made by male-female musical notes (in the participation of *peras* and *apeiron*);[412] and the generation of the musical scale through octaves and fifths can be considered in the light of the Pythagorean tradition (in the Neoplatonic sense of revival of Pythagoreanism), in imitation of the biological generation represented in the combination of 3 and 2 contained in the interval of fifth (3/2), and thus all the other musical notes can be considered the offspring of the fifth. This is our own interpretation and the Neoplatonists do not use directly the language of begetting for explaining the generation of the scale; however, we have seen that the Ancient Chinese theory of music mentioned it explicitly (cf. p. 46 ff. above, especially note 109). We consider that pointing

[411] Cf. Proclus, *In Timaeum* I.226.5; *Theol.Plat*. I.122, 3-10 and *El.Theol*. 151 ff. Cf. O'Meara (1989), p.205 ff.
[412] On male and female musical notes see Aristides Quintilianus, *De Mus*., III.20.

out this parallel enriches our understanding of Proclus' interpretation because he associated the double and triple progression of the scale of the *Timaeus*, (studied in the previous chapters) with the male-female complementarity (see *In Timaeum* II. 221.8). Aristides Quintilianus also used the language of "marriage" in a musical context and harmonic numbers are meaningful in the context of begetting (cf. III.12-13 and 23).[413] Plato's (*Republic* VIII 546a ff.: discourse of the Muses) notion of the "nuptial number" (Proclus commented this section with great interest, see *In Remp*. II.1 ff.) is another context in which music, marriage and mathematical proportions are brought together.

The triad "permanence, procession and return" is also connected by Iamblichus and Proclus with the *peras-apeiron* (male-female) complementarity, and occurs at every level of reality: in the Whole and reflected everywhere else in each part according to the mode of each level. It is beyond the limits of this study to cover this metaphysical conception in detail. But in order to understand Iamblichus' text and how these metaphysical relations can be found in the musical scale of the *Timaeus*, we need to consider this triad at the level of *Nous*, and in its manifestation as the triad of "Being, Life and Intellect".[414]

Musical analogy in the World-Soul scale according to Neoplatonic Metaphysics

We have already mentioned the correspondence between "limit (peras) and unlimited (apeiron)" and the double and triple progressions of the *Timaeus* (see pp. 43 ff.). "Limit" corresponds to the odd progression and the "unlimited" to the even progression; an association that is backed by Aristotle, *Metaphysics* 986 a 17 in general and by Aristides Quintilianus, *De Mus*. 102.10-12, 123.1-4, 126.5 ff, in its musical connotations.[415]

According to J. M. Dillon, this fragment of Iamblichus is one of the earliest references to the triad *mone, prohodos, epistrophe*, understood as a process that accompanies each hypostasis. Dillon says that there are two triadic processes in the text: the first for the noetic World and the second for the World of becoming.

[413] Cf. Mathiesen (1999), p. 426, note 137.
[414] The level of *Nous* as a whole contains these aspects or moments, therefore it contains also *nous* as one of its moments. This expresses the unity and complementarity (circularity) between thought and object of thought at this level. Cf. Dodds' commentary p. 232 of his edition of the *Elements of Theology* of Proclus. Cf. also Hadot (1960).
[415] For other sources on *peras* and *apeiron* in relation to music see Barker (1989), p. 33, especially note 19 and the bibliography quoted there.

The Tetrad acts as mediating influence and has to be considered, like the Soul, a mediation between two Worlds; all the numbers and the potencies connected with them are contained in the Soul that can be compared to the Tetrad, which is *panton periektike* and *panton ekphantike* of everything above and below respectively.[416] (We have already seen how all the musical intervals are contained in the Tetrad or *Tetraktys* in Chapter 1, pp. 47 ff.).

In Iamblichus' fragment, the Monad (1) is in the Soul, the cause of identity, unification and permanence, because it is an image of the Intellect, and it is in the terms of the progressions of the Soul the more akin to the One as First Principle and also corresponds to Being, the first moment in the noetic triad.

Proclus will come back later to the symbolic interpretation of the numbers of the Soul in *In Timaeum* II.221.26 – 231.2. According to the teachings of his tutor Syrianus, Proclus explains that the "mix" of the Soul "is not like a substrate of the Soul, nor like matter that is without shape"; but since the substance of the Soul is a form, it is a plenum of forms, and for this reason Plato does not say that the Demiurge inserts the portions in the Soul, but rather says that he takes them away as if they were already there, and doing this he recomposes again with them the substance of the Soul. Furthermore all the portions of the Soul (the double, triple, quadruple, nonuple, octuple and the one that is twenty seven times the first) are disposed in proportion to the first, the monad.[417] Syrianus says that in this way the Monad is honoured in proportion to its dignity,

> and does not permit anyone to think of it as 'the many' (*hoi polloi*) think of the monad: that is, as the smallest quantitative magnitude and having the status of matter in relation to number. Rather, one must think of it as the originary point of the entire essence of the soul and 'root' of all the powers in it, the 'hearth' (*hestia*) of all the numbers it fills up. (II.222.8).

This is what is called "*akron*", "centre", "flower of the soul", etc. in other texts by Proclus. The numbers of the Soul, and specially the Monad, are not like the abstract quantities that depend on matter and its divisions (these are the numbers that modern mathematics studies); the demiurgic numbers and harmonies are essential ones contained in the essence of the Soul.

The first portion or term appears in its musical representation as the first note of the scale, source of the subsequent octaves and fifths. The dyad (2) is provider of

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[416] Cf. pp. 331 ff. of Dillon's edition of Iamblichus (*In Timaeum.* fr. 53 Dillon).

[417] Proclus follows Plato's order: 1-2-3-4-9-8-27, in which 9 comes before 8 because he interweaves the double and triple progressions, which later were represented in the *lambda* scheme since Crantor, see p. 43 and 79.

procession and differentiation. Procession corresponds to overflowing and unlimited intelligible Life, which produces everything as from a full source, producing the musical octaves (the double progression); this shows that procession is made through similar and dissimilar things,[418] expressed in the fact that an octave is the same note in a sense, but it is different because it is placed at another level (octave). The relation 2/1 shows then the generative power of the dyad; the produced musical note (2) is similar to its cause (1), but it is at the same time different, in another position on the vertical line of the scale.[419]

For example, the initial E of the *Timaeus* scale in the procession produces an E in another lower octave. We have seen that the first octave of the World-Soul can represent the Intelligible; and in this sense can be understood as the intelligible Life that produces the Soul. The *Nous* transfers the generative power of continuing the production at the following levels (or octaves) to the Soul, and every level is generative of subsequent products imitating the model of intelligible Life.[420] This creative principle is symbolized in the *Timaeus* (41d – e) with the *Krater*, or mixing vessel in which the Demiurge composes the Soul.[421] But since, we are in a context of dynamic symbolism, once this Life has overflowed, the character of container is needed in another sense, as the aspect which, containing the "waters of life" that have been poured, makes them reflect the immutable Model, and in this way marks a limit of the procession at this stage and shows the return to the original source that is reflected in the surface of the waters in the vessel.[422]

This corresponds to the triad (3) as limit and third moment (in the triad "Being, Life and Intellect" of the *Nous*): the Intellect that gives form and defines everything making everything return to its Idea, contained in Being as model.

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[418] Cf. Proclus, *El.Theol*. Props. 28-30.

[419] A classical definition of harmony depicts it as "unity in difference"; as can be seen in the Pythagorean Philolaus fr. 6 (44 B 6, *apud* Stobaeus, *Ecl*. I, 21, 7 and Nicomachus of Gerasa, *Harm. Ench*., 252,17) On the Cosmos as a harmonic composition of "limit and unlimited" in Philolaus, cf. fr. 44 A 9; 44 B 1; 44 B 2; 44 B 6; 44 A 9 = Proclus, *In Timaeum* I.176. 22 – 177.2; and Plato's *Philebus* 26 b ff.

[420] Cf. Proclus, *El.Theol*. Props. 25-26.

[421] Although the mixture of the *Timaeus* is of three elements it can be related to the mixture of the *Philebus*. Regarding the *Krater* (mixing-bowl), this is known as symbol of the Orphic tradition, cf. *Orphicorum Fragmenta* (Kern), pp. 308-311 and West (1983), pp. 10-13, 262. The *Krater* corresponds to the principle of indivisible Life, in that Life all the other divisible lives are created; and in this sense it is symbolized as the "heart of Dionysus" identified by Proclus with the Intellect (*In Timaeum* II.145.5 ff.).

[422] The typical visible symbol of this is the ornamental fountain of three levels.

Because the third stage is the result of the potentiality of the second (*apeiron*) plus a return to the permanence of the first (*peras*).

This more active version of the "container" needs to find its way to the more permanent model of Intellect, back to Being, in a circle. In this way, Intelligence as third moment (it has the same name as the whole hypostasis as well, but is sometimes translated as "thought" to show the fact that it is the third moment) is the primordial cause of conversion and return for the beings that have followed procession. The demiurgic process imitates this, and everything that has emerged in the procession returns to its Principle.

Although Iamblichus is studying all these numbers *within* the Soul, the numbers reflect principles higher than the soul and since the soul is an intermediary reality, the numbers and proportions in the soul reflect its position and relation with the higher numbers, and also on the other hand with the following levels of reality because mathematical objects *in* the Soul are the paradigm of the physical numbers and harmonies.

Music expresses the containing aspect of return, acting as limit, in the interval of fifth, as we have seen before (see Proclus, *In Timaeum*. II.222.29 and pp.111-112 above). The interval of fifth is originated between 2 and 3 (3/1 is more precisely an octave + a fifth) and symbolizes the return through Intelligence. The fifth is precisely the interval that defines (gives limit to) the new notes that come into view in the Scale (for example from E to A; the A is already a new defined note; from the Latin "*finis*", limit).[423] In this sense, since music is in Pythagoreanism a model for other things, this "method" shows the way for a "method" for the soul's return in order to arrange its development turning around a centre that provides it with stability and tuning, in contemplation of intelligible Harmony.

Consequently, the fifths "return" and this makes them capable of symbolizing the metaphysical conversion to Intelligible being and towards the One as Principle of Unity for everything.

[423] For us, according to modern music theory, another aspect of the triple progression of fifths would be that the fifths are ordered in a cycle called the "circle of fifths", which, as we have already studied (see p.46 ff.), was a theory known by the Ancient Chinese theorists. Sometimes the "Pythagorean method" of the generation of the scale is connected to this theory (see p. 47). We have also mentioned the ascending fifth and the descending fourth as sources of the arrangement of the cycles of the days of the week and the seasons, etc (pp. 64 and 171).

Number 3 and the fifth are the cause of definition for the musical notes, that otherwise will follow their progression in the direction of "dissimilarity", following the tendency of the *apeiria* in its sense of division into the infinite, that is a derived infinite, and not the original Infinite that is without form because of being above form. But there is another lack of form, identified with matter, as a deficiency and dispersion. In this sense the method of musical tuning (in fifths) is an image of the "method" needed for the particular soul to achieve a containing harmony and concentration into the *hestia* of *Nous* represented in the first Monad, and not get lost in dispersion, in many activities pursued only for material and temporal gains.

The tetrad (4) is the complete harmony (pan-harmonious) because it contains all the musical intervals: the *Tetraktys* as the sum of 1 + 2 + 3 + 4. It contains the octave: 2/1; the octave plus fifth: 3/1; the fifth: 3/2; the fourth: 4/3; and the double octave: 4/2. Iamblichus says also that the Tetrad contains within itself a secondary cosmic order (*deuteros diakosmos*). The first cosmos (*prôtos diakosmos*) corresponds to the Intelligible World or the Model for the Demiurge (the Living being itself)[424], the second cosmos corresponds to the Soul that in turn contains the paradigm of the sensible World.

The ennead (9) is provider of real completion and sameness. It is the result of perfect and similar parts: 3 x 3. It participates in the nature of the Same and it is like a "new one" (after the etymology: "*hen neon*"),[425] because it has an analogous place to the first monad, having the position of *mone* or permanence in this last triad (9; 8; 27) (see figure on p. 194).

The ogdoad (8) has a position analogous to the dyad, because it belongs to the double progression, as cube of 2 (2 x 2 x 2). It is also, like the dyad, cause of procession; but while the dyad is cause of procession as an image of the infinite potency of the Intelligible in the Soul (the dyad represents procession of higher realities, i.e. the more simple beings), the ogdoad is cause of procession in general and progression (represented in the geometric progression) through all levels (since it represents in the Soul the causes that proceed to the levels that are lower than the Soul; towards more composed beings).[426]

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[424] Cf. for example, *In Timaeum* II.132.9.
[425] Cf. Proclus *In Remp*. II 4.20 and Hermeias *in Phdr*. 90.27 quoted by Baltzly in his note *ad.loc*.
[426] The ogdoad is an image of the dyad because it belongs to the double progression of the octaves, which corresponds to the geometric progression that ends in solid geometrical bodies.

The *eikosiheptad* (27) is provider of conversion for the last beings, because is the last term of the triple progression and a cube (3 x 3 x 3). It plays a role similar to the ogdoad (that is the source of procession until the last beings); and it is the symbol of the providence of the Soul over the sensible, that causes to return and carries off (uplifts) with itself even the realities more distant from their Principle.

Procession must have a limit (*peras*) in order to make the World a "cosmos"; and for this reason the progression of the *Timaeus* ends in number 27, a number of the triple progression, which shows the position where the return of the corporeal realities takes place. Cubic numbers, also known as "solids", represent the realities of three dimensions. The *ogdoad*, the cube of two, represents the procession towards three-dimensional realities; the *eikosiheptad*, the return from them.[427]

A limit for the cosmos is necessary because things must not be lost in "the sea of unlimited dissimilarity". This expression appears in Plato's *Statesman* 273d and shows that the metaphysical/mathematical character of procession has both cosmic consequences and implications for human life.[428] The maritime symbolism reminds us that the human soul has to return and not wander in the sea of material divisible realities. In the cosmic level, "procession" is contained when the divine Pilot recovers the helm and moves the World-Soul towards its orderly movement. Hence, the world is a complete and perfect whole, composed of harmonized parts, when its procession returns thanks to the Soul guided by the Intellect, and recovers the movement originally given by the Demiurge (and not following the "previous" —in mythological terms— chaotic state, that the world had "before" creation). Soul is the first harmonized reality, and in this sense it passes through a process of cosmic "forgetfulness" and "*anamnêsis*", recovering its primordial harmony,[429] when it is held by the Intellect, which is a whole before the parts

[427] On the spiritual whole before the parts cf. Proclus, *In Parm*., VI, 1097.21 – 1110.15 y 1112 – 1114; and *Elements of Theology* Props. 66 – 64; cf also Dodds' commentary in pp. 236 ff. of his edition of the text, for an explanation of the distinction between kinds of wholes: a) "the whole before the parts" b) "the whole of parts" and c) "the whole in the part".

[428] For a study of the myth of the *Statesman* together with a comparison with the *Timaeus*, see Mohr (1981).

[429] According to the *Timaeus* the Soul has received its harmony from the Demiurge. In the *Statesman*, the Soul receives teachings and harmonious movements but after a cosmic period (following the "procession"), the Soul forgets them and comes back to its own chaotic tendencies (proper to an attachment to the material world (that is only an image of the Soul itself). This exterior level is what has been produced after the "looking outside" and "*neusis*" of the Soul, which previously was looking inside to the *Nous*, as the myth of Narcissus shows, cf. Plotinus, *Enn*. I.6.8). In reality the cosmic Soul does not forget the teachings of the Demiurge; and the myth seems to represent how the world would be without a guiding Intellect; but this happens only in

(before harmony) and the model of the Soul's harmony (both in musical and arithmetic terms).

The procession reaches a limit and returns to Unity, from the triple (27 = 9 x 3) that is cause of conversion, in order that the Soul and the World may be a unified totality. The expansion of the World-Soul has been possible because of the "procession" of the octaves —the double progression (related to the *apeiron*) that is cause of the procession of the similar in different levels. On the other hand the interval of fifth, result of the triple progression (and *peras*), is cause of form, definition and return to Unity. One might say that the ratio between terms in the progression, 3/1, represents "reversion" onto the monad better than 3/2. Also the octave, which goes back to its starting point (and returns in this way) could symbolize reversion as well. However, the octave is connected to the idea of dyad and division, hence for Proclus, it represents progression.[430] The triple ratio and the *hêmioliôs* (3/2) are explicitly connected with conversion in Proclus, *In Timaeum*, II.222.29-223.10. We quote again this passage in its full extension because of its importance:

> If it is necessary to put the matter briefly, then it may be said that just as Life proceeds from Being and as Intellect is united with Life and Being, so too surely the procession of soul has come to be from the reproductive cause, but the reversion takes place with respect to both. It takes place in the mode of the 3:2 [ratio] (*hêmioliôs*) with respect to what is above it, but in the mode of the multiple of three (*triplasiôs*) in relation to what is beyond that which is above it. It pertains to the form of reversion to both seek after the whole and to lessen division, which is something that the hêmiolos [3:2 ratio] surely does. For while the muliple of two (*to diplasion*) subordinates itself entirely to the dyad throughout, the *hêmiolios* [ratio] is proportional to the former, but it is also a ratio where there is a lessening of deterioration. Furthermore, the triple multiple clearly shows that it is at the third remove in the order of reversion from that which remains [in the cause]. In addition, since the triad is a prime number /and a whole in the primary mode (*prôtôs*) by having beginning, middle and end, it is assimilated to the monad which includes the complete plurality in a unified manner.

In this way, there is in every level, as Iamblichus says, permanence, procession and conversion. In simpler beings, according to the numbers previous to the tetrad (and therefore in the musical scale, the simpler is exemplified with shorter strings and higher notes, like in a harp); and in the more complex beings, in relation to the numbers posterior to the tetrad (and longer strings with lower notes). The

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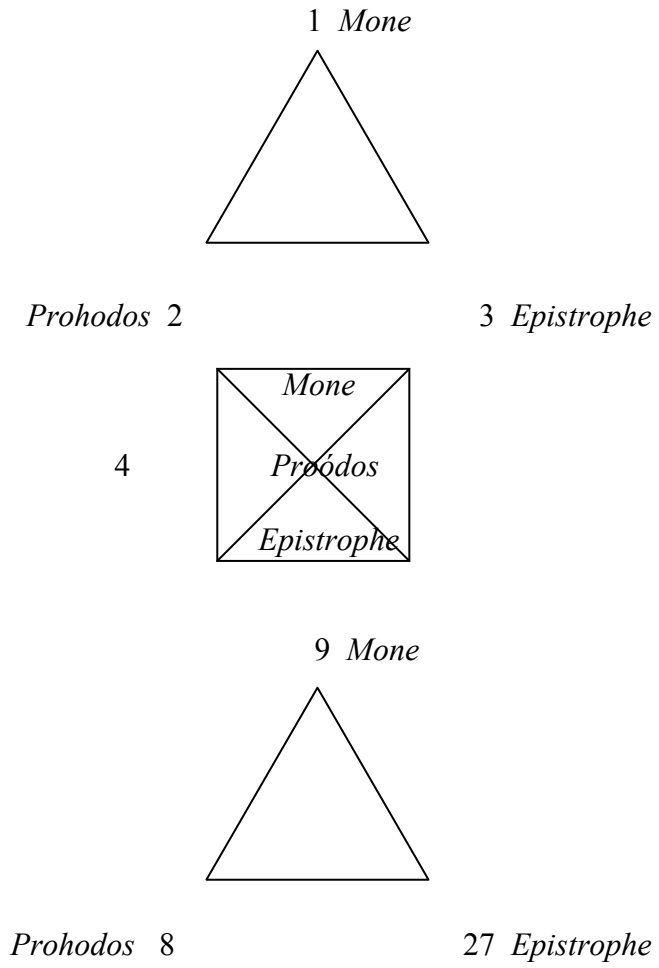
the level of particular souls who forget their celestial origin. But, still, this myth raises the problem of what is the cause of decline and degeneration in the world through different periods (the ages of the world): is it the will of men or is it a cosmic process? In a sense the World-Soul must contain in itself the cause of its own disharmony (Cf. Mohr, *ibid*.).

[430] However, since 2/1 contains 2 and 1, this ratio could be interpreted as connected to number 3 (2 + 1 = 3).See Proclus' reflections on the Monad, the Dyad and the bond, in *In Timaeum* II.13.15 ff.

tetrad is mediator, a symbol of the Soul in that capacity,[431] and contains the three moments in itself: permanence, procession and return towards itself:

Diagram 8:



In this diagram (7),[432] and also in the previous representations of the scale, presented in this study, the analogical nature of the World-Soul can be noticed.

[431] We have been considering Proclus' conception of the Pentad (and the musical fifth) as the mediator and unifying aspect, because the soul is a "fifth" component of reality, which englobes the tetradic aspect of the elements, directions (centres), etc. in the cosmos. Here, however, the tetrad is also associated with the intermediary character of the Soul. The tetrad symbolises the stability of the cosmos mirroring the permanence of the Intelligible model and Iamblichus and Proclus are applying here a different arithmetic symbolism, explained at *In Timaeum* II.207.25: "the cosmos participates in harmony in the manner of the decad. The soul, on the other hand, participates in harmony in the manner of the tetrad, while the things in the Intellect pre-exist in a monadic manner." The tetrad is in this sense a concentrated, or archetypal, model of the decad, because 1+2+3+4 = 10. We have seen that this *tetraktys* has important musical connotations. If we consider that we have two triangles and one square, the addition of the corresponding numbers is equal to 10. Accordingly, octaves made of tetrachords (which have fixed limits) represent the tetradic aspect of the Soul. On the other hand, both symbolisms (pentadic or tetradic middle) complement each other, because 5 is half of 10 and also is the arithmetic mean between 1 and 9, which together make 10.

This arrangement illustrates in itself an image of the Intelligible and a paradigm of the sensible, appearing itself (mirrored in the middle of the diagram) as an intermediary principle. The first triangle represents the Intelligible, and has procession (the octave, with number 2) and return (the interval of fifth with number 3). The second triangle represents the sensible world that has procession and return in its own manner.

The first three numbers are a clear expression of the metaphysical level; with number four, we move to the cosmological level and the creation of the physical world. In presenting the correspondences between the numbers of the *Timaeus*, the musical intervals and Neoplatonic metaphysics and cosmology we have not tried to survey the full range of possible associations, and we could not refer in detail to the very important role of Neoplatonism —in particular the commentaries on the *Timaeus*—, in the rich set of historical influences and developments of the theory of *musica speculativa* and *musica mundana.*[433] We had intended to show how for Proclus the musical language of the *Timaeus*, included in the mathematical sciences considered as analogical languages according to Pythagoreanism, is a very significant tool for expressing metaphysical theories that transcend the language of reason.

We will finish this chapter with another example of correspondences that are an echo of Iamblichus' and Proclus' approaches. It is a scheme of cosmological principles and parts of the world that starts in the Tetrad of the first four numbers (1,2,3,4) found in the already mentioned philosophical encyclopaedia known as "*Rasa'il* Ikhwan al-Safa' (*Epistles of the Brethren of Purity*)" that shows well the paradigmatic character of the Tetrad:

1 = the Creator, (the Creative Principle or Universal Being).

2 = the Intellect (in the sense of Universal Spiritual level)

3 = Universal Soul

4 = primordial *hyle* or "matter"

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[432] It is similar to Dillon's in his edition of Iamblichus' *Fragments* (1973), fr. 53 p. 332. This way of representing the progression of the *Timaeus* is related to the figure of the *lambda* already mentioned: Λ.
In the square that corresponds to the World-Soul and the Tetrad, there are two triangles inscribed, in order to symbolize the reception of the image of the Model of the Intelligible and the paradigm of the triangle that corresponds to the World.

[433] For a very complete historical survey cf. Haar (1960) and the collection of sourcebooks and studies by Godwin (see Bibliography).

and it is completed with the following levels: 5 = Nature; 6 = the absolute Body; 7 = the sphere that contains the seven planets; 8 = the 4 elements, each in correspondence to a double set of qualities; 9 = the beings of this world (divided in three realms: mineral, plant, animal).[434]

The levels are not exactly the same as those in Proclus and Iamblichus, but they have a very important resemblance with them. It is important for us, that the authors of this encyclopaedia (*Epistles*), also draw from these arithmological correspondences a very complex musical symbolism.[435]

[434] Cf. the article: Ikhwân al-Safâ', by Netton, I.R. in Craig (1998). Cf. also Netton (2002) and Nasr (1993).
[435] Cf. the references in note 387 above, for an account of this musical symbolism.

Chapter 4. The passage from intelligible-cosmic music to human music

The previous chapters discussed how music can be studied from a metaphysical and cosmological perspective, an approach that is proper to the discipline of Pythagorean and Platonic origin that was later known as speculative music (*Musica Speculativa*).[436] From a Platonic point of view all instances of music have their origin in intelligible Music, but this does not imply that Platonic or Neoplatonic views on music are restricted to the metaphysical or cosmological levels. At the same time, we need to take into account that the transcendent principles are present immanently in the sensible world, which is one important feature of Platonism. The Neoplatonists, following an important Pythagorean tradition, were very interested in the applications and influence of the intelligible principles of music and *musica mundana* in the human sphere. Even more so in the case of music, for the acquaintance with this art begins with its sensible manifestation. Music is not only a celestial art, it has also a human aspect and presence. Since childhood the role of music in human life helps to habituate the soul to Beauty and the Ideas, and continues to cultivate our essential constitution in the sense that it has an important *anagogic* role for conducting the human soul to its own original nature and from there to connect it with true reality, as we shall see in this chapter.[437]

We have concentrated until now on the higher level of Apollonian music, which is the aim of the ascent of the soul. We shall see that the ascent of the soul is assisted by music, since music follows the same progression —sense-perception, opinion, reason, intellection— that the soul needs to pursue in order to be receptive to the inspiration of the Intelligible. We need to discuss in this chapter the subsequent levels of human music and how the other levels interact with this particular level in the context of education. We shall study Proclus' theory of kinds of music, which appears precisely in his *Commentary on the*

[436] See Godwin (1982), already mentioned in note 192.

[437] "Anagogic" from *anagôge* = leading up, lifting up. Liddell-Scott-Jones quotes Iamblichus, *Myst.*3.7 and Porphyry, *Sent.*30. In the same dictionary, cf. *anagôgios* = "raising the mind to heavenly things, mystical". Cf. for example, Proclus, *El.Theol*, Prop. 158: elevative causes (*anagôgon aition*). Proclus mentions different divine qualities (*idiotês*) which correspond to different kinds of causes: paternal; generative; perfective; protective; life-giving; purificatory; conversive and elevative. Music participates in these qualities, especially according to the purificatory, conversive and elevative causes, because it belongs to the gods: Hermes, the Muses and Apollo.

Republic, where he also depicts the levels of poetry in correlation to levels of life. This is the dialogue where Plato explains the communication between the Intelligible realm and the realm of human life in society and how through education the soul can enter into contact with that higher level and produce an imitation of it in its own life and in the organization of society. Paradoxically this has to be arranged already in a microcosmic or analogical way to the macrocosm to permit this imitation to function; because if the soul is born in a disarranged society, such as the one that pursues only material aims, it is much more difficult for it to grow naturally and unhindered the link of *syngeneia* and *sympatheia*, which are proper to the kinship between the whole and the part. On the other hand a society that cares about musical education can achieve this aim because, as Proclus says:

> Music claims to put the soul in sympathy with beauty and in dislike to ugliness. (*In Remp.* I.54.22-24)

The aim of education, according to Plato and the Neoplatonists, is to elevate the soul to the *Nous* (the Intellect). In other words, to awake the *Nous* within the soul and to lead it towards the union with the One.[438] Although we already have the *Nous* within us, this principle, residing in the soul, is concealed or asleep and needs to be woken up or reactivated following a process of purification.[439] Music, as a source of purification and therapy for the soul,[440] has an important place in Plato's educational programme in the *Republic*: first, in combination with gymnastics, in the initial stage, and later on as one of the four mathematical disciplines in the *quadrivium*, which comprise arithmetic, geometry, harmony and astronomy, as we have seen.[441] At this second stage, these disciplines help the soul in its ascent to the Intelligible by virtue of belonging to an intermediate level, between the sensible world and the Realm of the Ideas.

Above the level of music as a "science", in the Pythagorean and Platonic sense, there is a higher level of inspired music. This kind of music puts the soul into direct contact with the principles of reality, through *syngeneia*, that is affinity or congeniality, and the presence of the divine harmony within the soul (affinity and

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[438] Cf. Plato's account of education in *Republic* 518b 7 and Plotinus *Enn*. 2.1.3.

[439] For example, Hierocles' *Commentary on the Golden Verses*, according to O'Meara (1989), p.115, is "intended to provide an elementary initiation to philosophy based on Pythagorean principles and aiming beyond itself towards a Pythagorean goal (cf. 7, 17 –18), assimilation to god." Cf. also *ibid*., pp. 16 ff. on the definition of philosophy and the role of mathematics in the flight of the soul according to Hierocles.

[440] Cf. Anne Sheppard (2005), pp. 148-55.

[441] See pp. 55 ff. and 102 ff. above.

presence are more direct than discursive knowledge because they are based on being and on the essential aspect of the soul, rather than on a cognitive aspect). Music, both as an inspired art and as a science, is considered to be anagogic in the sense that it helps the soul to ascend and return to its primordial origin; first with science as a cognitive activity that helps the soul assimilate to its archetype and secondly as inspired illumination which is a transformation of the soul's being as a whole, in a deeper or inner sense. This corresponds to a reactivation of the essential harmony, involving not only *dianoia* but divine *Nous* (not only the mind but the whole being).[442] This can be achieved because music is capable of putting the soul into contact with the divine, through *anamnêsis*, the remembrance of celestial beauty and sacred art.

We shall concentrate on Proclus' commentary on Plato's *Republic* together with other references to the commentary on the *Timaeus* that put emphasis on the educational and therapeutic role of music. In this context, music for the Neoplatonists is a reality which is richer than what is normally understood as "music". Music is not only "audible music", for it can be studied with reference to its metaphysical principles. Nevertheless, even at the level of audible music, the presence of metaphysical reality can be expressed in sounds because of inspiration and music's evocative power.

Music can also be considered from a cosmological point of view. According to Pythagorean cosmology, mathematics is the study of numbers as ideal principles of order. Music, in this sense, is conceived both as playing a role in the cosmic process of manifestation and in the structure of reality, and as taking part in the contemplation of this process.[443] At the same time, in this contemplation the cosmological level is an occasion for ascent, by being a symbol of a higher reality,

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[442] The *nous* is the "heart" of the whole being of the soul (cf. *Chaldean Oracles*: *Or.Ch*. fr. 1); music is directed to the soul as a whole, to the central *nous*; which joins both the affective and the cognitive. In this sense music is hieratic art, conceived for the substance of the soul, which proceeds from a more universal cause than the formal and demiurgic cause, which is intellectual. Universal essence is higher than the intellectual (according to the triad being-life-intelligence and the distinction between intelligible-intellectual). Hierocles (*In Carm.Aur*. 67-69, XXVI, 22 ff.) for example, mentions how hieratic elevation (*hieratikê anagôgê*) pertains to the luminous body or vehicle of the soul. He says that mathematics purifies the pneumatic vehicle of the soul and that telestic purifications go along with mathematical purifications. Hierocles continues (27 ff) explaining that the contemplative is in a sense like the *akron* (the summit) and the eye of the soul (*the nous*), while the practical is analogically like the hand (civic virtues) and the foot (telestic virtues). The hieratic method is needed because it is not enough to think about Truth, it is necessary to set the soul in motion to it: that is the task of hieratic music in Pythagoreanism.

[443] Cf. Aristotle *Met*. 985 b 23. This famous testimony states that for the Pythagoreans the principles of number are the principles of the Universe and the whole sky is harmony and number (see p. 44 above).

which has the effect of attraction for the soul (in relation to love of beauty and the affective part of the soul). Accordingly, "harmony" refers not only to the object of a cognitive science, a theory concerning the proportions and relations between numbers and musical intervals —this falls within the area of *harmonics* in relation to the structure of scales and melodies—, but also harmony is a creative organizing principle which produces proportion (*analogia*) and manifests unity in the cosmos, activating the *anamnêsis* of the soul through living beauty.

This approach is based on the interpretation of *Timaeus* (35c ff.) considered by Iamblichus and Proclus as the most important Platonic dialogue regarding cosmology, for it depicts the composition of the World-Soul in musical terms (studied in Chapter 1). Hence, the Neoplatonists' references to the Intelligible and cosmic music are frequently tied to this dialogue. This Pythagorean understanding of music is the central idea around which all other kinds of music revolve. With this universal notion of music in mind, the Neoplatonists are able to talk about manifestations of music in different levels of music, some of them being audible while others not.

The notion of harmony as the principle that organizes a multiplicity thus bringing *henôsis* (unification) is, according to Iamblichus, a Pythagorean doctrine.[444] This is the main kind of music that can be called "intelligible Music", which has its source from Apollo. On the other hand, the creation of a "cosmos" is not restricted to the macrocosmic level; there is also a "harmonization" and *henôsis* in the microcosmic level of our own life and the society in which we live, a subject studied in ethical and political treatises.[445] In the same way that the World-Soul's harmony corrects the disordered pre-cosmic movements in cosmological terms, music corrects the negative impulses of human nature from the perspective of ethical and political virtues. This conception, too, is based on the Pythagorean analogy of the political constitution with the organization of the universe that reappears in Plato's *Republic*.[446]

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[444] Cf. Delatte (1922), p. 138, where he quotes Philolaus, Theon of Smyrna, Iamblichus, etc., all authors that use terms such as *synarmoga*, *henôsis*, *krasis*, etc. as key concepts for the definition of music.

[445] Cf. Delatte, *ibid*. for a general examination of the relation between politics and music in Pythagoreanism, especially p.40; 83 ff.; 90; 118; 120; 136 ff.; 145; 167; 175 (cf. the word "*musique*" in the index).

[446] Cf. Delatte (1922), p.58, where this author examines Iamblichus' testimony on the Pythagorean relationship between music and politics.

As we have mentioned above, the source for the Neoplatonic understanding of cosmic music is Plato's *Timaeus*. However, this dialogue also presents the foundations for the study of human music, for it portrays the microcosm-macrocosm analogy. The *Republic*, on the other hand, complements *Timaeus*, for it discusses cosmic music reflected in the city and deals with music from an educational point of view and in relation to the human soul, though not exclusively in connection to the World-Soul, as in *Timaeus*. The music of the *Timaeus* was inaudible and mathematical (corresponding to the intermediary position of the World-Soul), but the harmony of the spheres depicted in the myth of Er can be heard (as is depicted in Plato's account)[447]. Although in one aspect the depiction of the harmony of the World-Soul in the *Timaeus* is intended to be a model of the cosmic harmony, in the dialogue it is never said to be audible, as James Haar has pointed out.[448] This author remarks that the depiction of the music of the spheres in the *Republic* is the natural counterpart of the ideal harmony of the World-Soul that cannot be heard.[449]

The passage from celestial music to human music is possible because of the analogical structure of levels according to which the World-Soul is mirrored in the human soul (the city, or society, in turn mirrors the human soul). Robert Fludd expressed this mirroring in the following text:

> For what is more conformable to the celestial music than man? In his wonderful constitution there is an image of the whole *musica mundana*, thanks to the double consonance of octave and fifth.[450]

Music and the ultimate aim of philosophy and life

Fludd's text shows that the level of cosmic music is mirrored in the human soul. However, at the same time we need to take into consideration that according to Plato, when the soul entered into the sensible world, the image of divine harmony was concealed and the soul's own harmony distorted. When the soul was

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[447] Cf. O'Meara (2007).

[448] Cf. Haar (1960), pp. 2 ff. This author remarks that the account of the music of the spheres in the *Republic* is the complementary aspect and natural counterpart of the ideal harmony of the World-Soul that cannot be heard.

[449] The planetary music of the *Republic* cannot be heard with the physical ears either, but it can be perceived with the subtle ethereal vehicle of the soul (the ear of the soul). However, in one sense the Soul as *logos* of the Intellect can be conceived as an utterance or resonance of the inaudible intelligible harmony.

[450] *Tractatus Apologeticus Integritatem Societatis de Rosea Crucis defendens*, Leiden, 1617, excerpt translated by Godwin (1987), p. 145. It is not important for us to explain what Fludd means with the octave and fifth (it is possible that he is indicating with this the structure of musical harmony based on the intervals of octave and fifth).

made by the Demiurge, as depicted in the *Timaeus*, its nature was essentially a harmony, mirroring and having the same origin as the harmony of the World-Soul (41d-e). However, once the partial (*merikê*) soul, that is the human soul, enters into the sensible world (which is divisible into parts), a disarrangement is produced. As a result, its essence is not completely recovered during the first stages of education. For this reason the soul needs to follow a process of purification, habituation to beauty and assimilation to the object of contemplation.

For the Neoplatonists, following the Pythagoreans, music has an application in the contemplative part of philosophy (*theoria*, which implies the contemplation of the cosmos and its principles), but also in the area of practical philosophy that Iamblichus connects with a wisdom acquired by practical virtue.[451] Even theoretical sciences have the practical aim of turning the soul to Intellect, as Iamblichus explains in this work in the context of Plato's *Republic*. The sensible world has covered the eye of the soul (and its ear) with outward concerns; therefore the recovering of the inner essence and harmony implies a detachment of the secondary, withdrawing into the self (with the help of anagogic sciences) and as Plotinus says (*Enn*. I.6.9.13) working at the statue of inner virtue. This is done by cutting away the redundant until we find a shining reality inside: which also means becoming receptive of the illumination of the divine *Nous* and resonant to its harmony.[452]

In this context we can expect that music, which is one of the sciences and itself a kind of "*henôsis*", will be very important in the practical context of purification, illumination, assimilation and returning to the One, the ultimate goal of philosophy for the Neoplatonists.

The notions of purification and assimilation can be found in many Neoplatonic philosophers. For example, the *Commentary on the Golden Verses* (*In Carm. Aur.*) by Hierocles, contains important general views, which can be applied to music. At the beginning of this work, the Neoplatonic philosopher deals with the

[451] Cf. *Protrepticus* IV, p. 53, 4 ff. Des Places. Iamblichus ascribes the distinction of theoretical and practical virtues to the Pythagorean Archytas.
[452] Cf. Hierocles, *In Carm.Aur.*, Proem, 3 ff: "Just as the bleary, uncleansed eye cannot behold exceeding brightness, so the soul that has not secured virtue is incapable of reflecting the beauty of truth."

definition of Pythagorean philosophy, which is identified with Platonic philosophy.[453]

> Philosophy is a purification and perfection of human life: a purification from our irrational, material nature and the mortal form of the body, a perfection by the recovery of our proper happiness, leading to divine likeness. (Proem., 1 ff., transl. Hermann S. Schibli)[454]

Music shares similar aims with philosophy defined in these terms. For it also possesses a cathartic effect on the soul. And since the divine level is characterized by intelligible Harmony, musical contemplation, as the *Timaeus* states (90a – d), renders the soul's natural harmony akin to the divine harmony again. In this way, the soul recovers its original perfection in terms of musical proportions, which as we said, were disturbed when the soul entered into the material world (*Timaeus* 42e – 44d). Hierocles goes on to state that, through Pythagorean philosophy

> one may acquire truth and virtue, regain one's purity, succeed in obtaining likeness to god, and, as Plato's Timaeus, that keen teacher of Pythagorean doctrines, says, having become 'healthy and whole, arrive at the form of one's previous state'.

In Neoplatonism there are different metaphors expressing the re-orientation of the soul towards its principle.[455] For example, *epistrophê* (conversion or return), *anabasis* (ascent)[456], *egersis* (awakening), *anamnêsis* (remembrance), and *trophê* (nourishment). Proclus combines all these aspects according to different Platonic myths which express the return to the Intelligible, namely the ascent in the Allegory of the Cave and the Myth of Er, in the *Republic*, and the myths in *Phaedrus* and *Phaedo*, etc. In Proclus' *Commentary on the First Alcibiades* (195-196) for example, the notion of nourishment of the soul with the sciences brings to mind the nourishment of the chariot of the soul in the meadow of Truth in *Phaedrus* (cf. p. 209 below).

To illustrate the return of the soul the Neoplatonists usually make reference to Plato's *Theaetetus* (176a ff):

> We ought to try to escape from earth to the dwelling of the gods as quickly as we can; [176b] and to escape is to become like God, so far as this is possible; and to become like God is to become righteous and holy with the help of wisdom. (transl. Harold N. Fowler with modifications)

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[453] Hierocles says that the *Golden Verses* encompass the universal doctrines of all philosophy, both practical and contemplative. See, O'Meara (1989), pp.114 ff for a summary of this work and its relation to Iamblichus and Proclus.

[454] Cf. Schibli (2002), p. 170 for a commentary on this passage.

[455] Cf. John M. Rist (1967), p. 196 ff. on the language of the ascent of the soul in Plotinus (especially *Enn*. 4.8.1).

[456] For the *ascent* of the soul to God, cf. Hierocles, *In Carm.Aur.* XXVI, 10 ff.

Neoplatonic thinkers emphasise that the "flight" and "return" is not understood in a literal sense, as abandoning life on earth, but rather as a process of acquiring likeness or assimilation to the object of contemplation, that is the Divine. The aforementioned passage from the *Theaetetus* is used by Plotinus in *Ennead* I, 2, 1, in his explanation of virtue and he echoes the same passage in *Enneads*, I,6,8,12-21 in a very significant way:

> 'This would be a truer advice', Plotinus states, "Let us fly to our dear country." What then is our way of escape, and how are we to find it? We shall put out to sea, as Odysseus did, from the witch Circe or Calypso —as the poet says (I think with a hidden meaning) — and was not content to stay though he had delights of the eyes and lived among much beauty of sense. Our Fatherland is there whence we have come, and There is the Father.' (transl. Armstrong with some modifications)

Here Plotinus combines the notion of escape, derived from the *Theaetetus*, with the journey of Odysseus. This journey is understood in an interior (esoteric) or spiritual way and the return to the Fatherland as a re-establishment in a previous state of the soul.[457] Consequently, the stages in this journey of ascent, namely the steps in the ladder of the planets, should not be understood as stages in space but rather as gradual states of being in the soul's metaphysical journey. Music helps to transcend the literal meaning of the stages and interiorize them as degrees in a musical scale, that is, in the harmony of the spheres.[458] We will study later why Odysseus' journey can be understood as a musical journey.

Since in the *Timaeus* the soul's potentialities are related to musical intervals and proportions, consequently the assimilation to divine harmony and the recovering of the soul's harmony is connected with musical education and therapy. This is stated in a passage in *Timaeus*:

> Now there is but one way of caring for anything (*therapeia*), namely to give it the nourishment and motions (*trophas kai kinêseis*) which are natural to it (*oikeias* = proper to each level of reality). The motions which are naturally akin (*suggeneis*) to the divine part within us (*en hêmin daimon, genius*) are the thoughts and revolutions of the universe; these, therefore, every man should follow, and correcting [recovering] those circuits in the head that were deranged at birth [in sensible becoming], by learning to know the harmonies and revolutions (*harmoniai kai periphorai*) of the universe, he should assimilate (*exomoiôsai*) his thinking part to the object thought, according to its pristine nature [recovering its original nature], and having assimilated (*homoiôsanta*) them win the fulfilment of the perfect life set by the gods before mankind both for this present time and for the time to come. (90c – d) (transl. Cornford with modifications)

A.E.Taylor comments on this passage pointing out that Plato combines here two Pythagorean doctrines:

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[457] Cf. p.15, Pépin (1982), 3-18.

[458] The higher states of the soul are represented with various symbols, singing birds or cicadas on a tree, or the seven sciences, as in Dante's *Convivio*, II, XIII, 1 ff.

> […] the thought of science as revealing the celestial melody and the constantly recurring thought of so many Platonic dialogues (…) that our task in life is to 'follow God' or 'become like God' (*homoiôsis theôi kata to dunaton*).[459] We become like God when the revolutions in the soul, or the head, are brought into tune with the cosmic revolutions and this is also the condition of our being 'sensitive' to the music made by the celestial bodies.[460]

Music and harmony considered from a Pythagorean/Platonic ethical and political perspective is included in the holistic context of the search for happiness and the *telos* of human life. The classical Greek concept of *eudaimonia* reappears somewhat transformed in Neoplatonism, especially according to Plato's use of the notion of *daimon*, the divine part mentioned in the passage of *Timaeus* quoted above and also in *Republic* 617e ff. The more characteristic quality of our being is our *daimon* or *genius*, and our happiness (*eudaimonia*) is to live according to this *genius*, who is as well identified with the Intellect, or more properly with the personal guide or guardian spirit that leads the soul to Intellect (in the sense that at one stage, the guide is at the same time the aim, as when one is walking and following the steps of another in front; especially in this case, because the Intellect is not a particular reality, like the soul).

Music and the care of the genius

The return to the genius can be understood as the return to our archetype, which corresponds in the *Timaeus* to a

> journey back to the habitation of [our] consort star (*oikêsin sunnomou astrou*) and there live a happy and congenial life (*bion eudaimona kai sunêthês*). (*Timaeus*. 42b, transl. Cornford)

This "return", in Neoplatonism, can happen now and here, and hence the value of music and its capacity of evoking the archetypal music of the stars that are the dwelling places of the archetypal souls. Plato himself, in agreement with the Pythagorean tradition, connected the care and "therapy" of the *genius* (our care towards it) with musical contemplation in the *Timaeus* 90a - c, the passage that precedes the text quoted above.

> As concerning the most sovereign form of soul in us we must conceive that heaven has given it to each man as a guiding genius—that part which we say dwells in the summit of our body and lifts us from earth towards our celestial affinity, like a plant whose roots are not in earth, but in the heavens. And this is most true, for it is to the heavens, whence the soul first came to birth, that the divine part attaches the head or root of us and keeps the whole body upright. [Now if a man is engrossed in appetites and ambitions and spends all his pains upon these, all his thoughts must needs be mortal and, so far as that is possible, he cannot fall short of becoming mortal altogether, since he has nourished the growth of his

[459] Mainly the already quoted *Theaetetus*, 176 b-c, *Republic*, 613 b, etc.
[460] A.E.Taylor (1962), p. 634.

> mortality. But if his heart has been set on the love of learning and true wisdom and he has exercised that part of himself above all, he is surely bound to have thoughts immortal and divine, if he shall lay hold upon truth, nor can he fail to possess immortality in the fullest measure that human nature admits;] and because he is always devoutly cherishing the divine part (*therapeuonta to theion*) and maintaining (*eu kekosmêmenon*) the guardian genius (*daimon*) that dwells with him in good state, he must needs be happy (*eudaimon*) above all. (Cornford transl.)

For Plato the soul comes from the heavens to the earth and still remains connected in tension to its original dwelling, established like a plant with its roots above. To maintain this connection we have the gift of the *genius*, that is what lifts us if we live according to its call, which is an exhortation to learning and wisdom, accompanied by the uplifting capacity of the sciences (in the ancient meaning of this word) and arts.

The Platonic concept of education as therapy and nourishment of the soul, has two aspects. First purification, and secondly, imitation or assimilation. To these two aspects we may also add the need of a guide and a model for the return, in terms of assimilation. The guide helps the soul to re-orientate towards the principles; a re-orientation that is required to reactivate the sight and hearing of true reality, which are possible only if one turns in the direction towards the source. Plato defines education as this turning around (*Rep*. 518c – d): the image that he uses presupposes that one has the light behind his back (like the prisoners in the Cave), and then, that the eye cannot turn by itself but needs to involve the whole body to turn around towards the light; the same analogically happens with the eye of the soul. We already have an eye (the intellect), but we need to turn around with the whole soul, from the realm of *genesis* towards true being and the brightest part of this archetypal reality, which is the Good. Music plays an important role because it is intended towards the whole soul (which is like the body or vehicle of the intellect), and being a kind of harmonic movement is able to put the soul in movement, taking it out from its impasse in the sensible world with the help of Beauty, which is the motor of that movement and love.

The idea that it is not possible to turn back the eye of the soul without turning the whole body, where this eye is located, reminds us of the Neoplatonic notion of *epistrophê* (conversion). This idea reappears also in Plato, in the metaphor of the chariot of the soul, where the head corresponds to the charioteer and the intellect, which needs also to control the movement of the horses, to go to the place of contemplation. There is also an "ear" of the soul, and first it needs to be emptied of the noise of the sensible world (that corresponds to darkness), to be receptive

again and after this to orientate it in direction to the source of divine harmony (corresponding to light).

Music plays an important part in all these aspects of Platonic education, as an art that prepares the soul and makes it fit for the return and cohabitation with the divine, represented with the return to the corresponding star. In a similar way to the previously mentioned phases in education (purification, guidance and assimilation), the first stage of music purifies the soul and habituates it to beauty, during childhood. The intermediate stage corresponds to music as a guide towards intelligible reality, music as part of the *quadrivium*, which is directed towards the harmony of the spheres. The higher stage can be understood as an appropriation (*oikeiôsis*) of the unitive life through musical likeness and harmonization of the essential life of the soul. This level corresponds to a life in harmony (also mirrored in civic life), where the soul departs from a fragmentary life to enter the unitive life, which corresponds to the metaphysical principles. Therefore the practice of harmonization is more a preparation for receiving a higher harmony and life as a gift than an outward activity.[461]

Proclus in his *Commentary on the Republic* distinguishes three kinds of life that correspond to three kinds in poetics. Proclus mentions the awakening of a transcendent life in the soul and depicts it in these terms:

> We say that there are three species of life in the soul. The best and more perfect is that life according to which the soul is bound to the gods and lives the life that is more akin (*syngenestatên*) to them and that unites it to them through the highest likeness (*homoiotetos akras*); this life does not belong to itself but to the gods, where the soul has surpassed its own intellect, and has *awakened* within, the ineffable character of the unitive substance of the gods, and has unified the like to the like: its own light with the light there, and that which is more unitary in its own proper essence and life (*oikeia ousias te kai zoes*) with the One over all essence and life. (*In Remp*. I 177, 15-23, ed. Kroll).

Proclus refers after this to other two kinds of life that correspond to two levels of poetry and music that follow the same order of the procession of life. These two are, in descending order from the principles: a second and intermediary level of life according to the soul's own intellect, together with science and discursive thought, and a third level that corresponds to the sensible life, which starts with imagination and continues with sense-perception and the irrational part of the soul. The third level is from our point of view the closer to us (and first in our ascent), and from here the Platonic education mentioned above starts as

[461] On a similar characterization of "harmony", according to different levels, see Ptolemy, *Harm*. III.3.

"purification" and "therapy"; while the higher level corresponds to "assimilation", which is the goal of education.

Between the purification of the soul and the goal of assimilation to its model, there is an intermediary aspect that was compared to guidance by us, but that can be also identified with nourishment. At this level music is an anagogic science that corresponds to the awakening of the intellect in the soul, where *logos* is nourished by the divine Intellect. As we said above, music, as a liberal art, is one of the mathematical sciences of the *quadrivium* (that correspond to the intermediary status of the soul). This tradition was connected to the god Hermes (or Mercury), as appears in the work by Martianus Capella, *On the Marriage of Philology and Mercury*.

Hermes as genius and guide

Hermes is the guide of the Soul, as comes into view in the Neoplatonic exegesis of Homer's *Odyssey* (Book X). Hermes is the god who gives the gift of the memory of the Fatherland to Odysseus, presenting him with the holy herb "*moly*" as an antidote to Circe's potion. The herb is depicted as having a black root and a milk-white flower and in Neoplatonism represented the healing power of the *logos* and the blossoming of the flower of intellect in the soul.[462]

In Proclus' *Commentary on the First Alcibiades* (*In Alc.*), Hermes plays the role which in Plato corresponds to the good genius (similar to a guardian angel), the archetype for each soul. This divine archetype guides the soul to the ultimate principle, which is the One.[463] In this *Commentary* (195-196), after stating that the soul is like a musical instrument, the lyre invented by Hermes, Proclus goes on to

[462] Cf. Hugo Rahner, *Greek Myth and Christian Mystery*, New York, Harper and Row, 1963, p.192 ff (Chapter V: "Moly and Mandragora in Pagan and Christian symbolism"). According to this author, already in the Stoic exegesis of this myth, *moly* represents the gift of *logos* (p.194). This author points out that the Neopythagoreans and Neoplatonists interpret the myth as having a "psycho-therapeutic implication" and meaning that "a healing of the soul, a transition from the chthonic root to the heavenly flower, can only be effected through a power that comes from above". The white flower is related in Neoplatonism with the Chaldean symbol of the "flower of the Intellect", related to the light of the Intellect, and as a gift of Hermes is identified with the divine spark of fire within the soul (p.197). Themistius and other writers interpret that as Hermes is the divine *logos*, the heavenly gift of moly is the heavenly *paideia* (p.202).

[463] In this Platonic dialogue, according to Proclus, Socrates also plays the role of the good genius, and shows Alcibiades what is the real inner man, the true self, in contrast to the terrestrial man. This is the same role of Hermes showing the primordial archetype of man's life and showing how to convert to oneself and return to the archetype through the presence of the divine in the soul's intellect.

explain what he calls the Hermetic (Hermaic) disciplines in education, which comprise gymnastics, music, the mathematical sciences and dialectics:

> The mathematical sciences and dialectics awake and elevate our reason; for the eye of the soul, which is asleep and obstructed, because of many other occupations, under the influence of them is re-ignited and returns towards itself and to self-knowledge. With these sciences our logos is nourished and through them ascends towards the Intellect, as Socrates says here. (Proclus, *In Alc*. 195-196, my transl. based on Segonds)

Proclus, in order to explain the conception of education in the *First Alcibiades*, uses the metaphor of awakening introduced in *Republic* VII where Plato depicts how these disciplines help in the awakening of the eye of the soul, obstructed by concerns about this world.[464] Proclus uses the verbs *anazôpyreitai* and *anagei* that Plato uses in the *Republic* VII, 527 e ff. and 533 d 2 ff.[465] We can find also in this passage the notion of nourishment of the soul that comes from the *Phaedrus* (247d ff.) and also from the passage of the *Timaeus* (90c - d) quoted above.[466]

The context of *Republic* VII shows that these sciences, music included, are *anagogic*: they make the soul (*logos*, reason) ascend to the Intellect. Hermetic music is *anagogic* and guides the soul to the Intelligible music of the Muses and Apollo. This power of music is clearly affirmed by Proclus in his *Hymn to the Muses*:

> We hymn, we hymn the light that raises (*anagôgion*) man aloft, on the nine daughters of great Zeus with splendid voices (*aglaophônous*), who have rescued […] the souls who were wandering in the depth of life, through immaculate rites from intellect-awakening (*egersinoôn*) books, and have taught them to strive eagerly to follow the track leading beyond the deep gulf of forgetfulness, and to go pure to their kindred star from which they strayed away, when once they fell into the headland of birth, mad about material lots. […] That the race of men without fear for the gods may not lead me astray from the most divine and brilliant path with its splendid fruit (*aglaokarpou*). Always draw (*helkein*, *Republic*, 533d 2) my all-wandering soul towards the holy light, away from the noise of the much wandering place of generation (*homadoio polyplanktoio genethlês*). (transl. R.M. Van den Berg).

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[464] The *First Alcibiades* deals with the return of the soul towards itself (and self-knowledge), and how from that stage of concentration the soul turns to the divine *Nous*.

[465] Ptolemaïs and Didymus (harmonic theorists quoted by Porphyry) said that the Pythagoreans used sense-perception to provide reason with a spark (*zopyron*) to kindle their ascent to the study of music through reason on its own. See Porphyry, *Comm*. 23.24-24.6 and 26.6-29 and Barker (1989), pp. 240-243.

[466] Cf. also *Protag.,* 313 c 5 -6; *Rep.*, III 401e 1. It is interesting to find *trepho* (nourish) related to *epistrophê* in Neoplatonism. Although *trepho* and *trepo* have different roots, the connection between the notions of nourishment and return would allow putting these terms together in relation to a conception of "true being" identified with descending nourishing light (for plants) and ascending divine fire (that in the allegory of the cave is at the top of the cave), and a re-orientation towards the Sun (*tropos, periagoge*), etc.

In the first instance we notice in this text the anagogic character of music and also the connection between sound and light.[467] The notion of wandering (proper to the Soul, typified in Odysseus' wanderings) is mentioned too and the consequent need of return (*epistrophê*). This return is compared to an "awakening" of the *Nous* and it is the recovery of kinship with the divine, represented in the origin of the soul in a "kindred star" according to *Timaeus* 42b, quoted above.

Another aspect of Hermes that we have already seen is memory, and since the mathematical sciences are for Proclus *anamnetic* of the Intelligible it is not difficult to see the connection between Hermes' gift of memory and the sciences (and not only in reference to the mathematical part of the liberal arts, because Hermes is connected with the arts of language as well: the *trivium*). This god is also closely related to music as a practical art, especially because he is the inventor of the Lyre.

The remembrance of the harmony of the spheres

The Muses as daughters of Zeus and Mnemosyne are as well goddesses of memory as Proclus expresses in his *Hymn*, because they lead away from forgetfulness. The soul, according to its primordial nature was able to perceive spiritually a music that was already present around it, before sensible music. Now the soul remembers it and gets a glimpse of it. Macrobius expresses this doctrine in his commentary on Cicero's *Dream of Scipio*, Book II,3,7:

> […] the soul carries with it into the body a memory of the music which it knew in the sky (transl. W.H. Stahl)

The music of the Sky or Heaven means two things, as we are going to see: it can correspond to higher levels of being, the Muses and Apollo (*metacosmic music*), or it can be the music of the macrocosm, represented with the Sirens. The memory of the divine music can be more or less forgotten, but the contemplation of the cosmic music can bring this memory back. There is then an objective presence of a higher music in the macrocosm, and also and not less important, a subjective presence of divine harmony within the soul, which corresponds to true being and inner essence. In this context, the intermediary realities are very

[467] Cf. Cornford, *Plato's Cosmology*, p. 151-152, where the author considers the importance of sight and hearing in the *Timaeus*, and how these two senses are the more important to reveal the harmony of the world. He quotes also Aristotle, *Eudemus*, frag. 47, 48 that claims that sound and light reveal harmony to mankind.

important to connect subjectivity and objectivity and guide the soul towards a *noetic* level of harmony where that opposition is reconciled. Divine inspiration and the messengers of the gods that act as intermediaries between the audible and the inaudible music can bring closer again divine harmony, contemplated outside in the cosmos but also experienced within the soul, as a recovery of its inner harmony, which connects it with the One. With their help the soul can pursue the assimilation to divine music through the imitation of its different manifestations in analogical levels. According to Iamblichus, one of these messengers was Pythagoras. Pythagoras was sent into the material world by the gods with the divine gift of Philosophy and Music.[468]

Iamblichus explains Pythagoras' educational programme as designed in a way that takes into account the nature of the human soul as it is in this world and for that reason in its first stage music has a therapeutic significance, and gradually guides the soul to higher levels:

> He [Pythagoras] thought that the training of people begins with the senses, when we see beautiful shapes and forms and hear beautiful rhythms and melodies. So the first stage of his system of education was music: songs and rhythms from which came healing of human temperaments and passions. The original harmony of the soul's powers was restored, and Pythagoras devised remission, and complete recovery, from diseases affecting both body and soul. It is especially remarkable that he orchestrated for his pupils what they call 'arrangements' and 'treatments'. He made, with supernatural skill, blends of diatonic and chromatic and enharmonic melodies, which easily transformed into their opposites the maladies of the soul […] using the appropriate melodies like mixtures of curative drugs. (*De Vit. Pythag.* XV 64, p. 35, 16 - 36, 7, transl. G. Clark)[469]

Noteworthy here is the analogy between music and medicine.[470] Iamblichus portrays blends of musical genera (in the ancient sense) and compares them as some kind of "*pharmaka*", an idea that matches with the notion of music as an Apollonian art.[471] Music therapy has also a Hermetic character, because as we have seen Hermes is the god that prevents the transformation of Odysseus into an animal under the spell of Circe, and provides him with an antidote that helps him to remember his original Fatherland. Music is in the same sense understood as an antidote in the Pythagorean tradition, and it is able to bring the soul back to health and virtue, establishing it in a divine music which corresponds to the original

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[468] Cf. O'Meara (1989), p. 37.
[469] Cf. O'Meara (2007), p.151 ff. O'Meara quotes this passage in the context of an explanation of Pythagoras' ability to hear the harmony of the spheres.
[470] On the music/medicine analogy see also Aristides Qunitilianus, *De Mus*, II.14, 80.10 ff. and II. 16, 85.21 ff.
[471] Proclus following Plato's *Cratylus*, presents Apollo as the god who presides over medicine, divination, archery and music (cf. *In Crat*. 174.34).

dwelling of the soul in the Intelligible realm, as the text of the *Timaeus* already quoted explained.

We refer the reader to O'Meara's (2007) interesting analysis of the text of Iamblichus; however it is relevant to continue quoting Iamblichus' text because it summarizes ideas that we have mentioned before. Iamblichus distinguishes the music used by Pythagoras for curing his students, which is an imitation, from the celestial music, which is the model that Pythagoras was able to access by a special gift:

> He no longer used musical instruments or songs to create order in himself: through some unutterable, almost inconceivable likeness to the gods, his hearing and his mind were intent upon the celestial harmonies of the cosmos. It seemed as if he alone could hear and understand the universal harmony and music of the spheres and of the stars which move within them, uttering a song more complete and satisfying than any human melody, composed of subtly varied sounds of motion (*rhoizêmatôn*) and speeds and sizes and positions, organized in a logical and harmonious relation to each other, and achieving a melodious circuit of subtle and exceptional beauty. (*De vit. Pyth*. XV 65, p. 36, 15-37, 2; transl. Clark)

The notion of likeness reappears in this text together with an important reference to different levels of music. Instrumental music and song are transcended towards a direct experience or intuition of the divine music of the harmony of the spheres. We can see in this text different kinds of levels of music: instrumental, songs, human and celestial or cosmic music. If it is probable that Iamblichus' source (for this part of the *Life of Pythagoras*) is Nicomachus, as O'Meara points out[472], we can suppose that also the source for the famous Boethian categories of music is Nicomachus.[473] Here, as the reader may have noticed, it is possible to identify "songs" (in Iamblichus: "he no longer used instruments or songs") with Boethius' level of *musica humana*. This identification is not new and was made already in Medieval times by commentators or authors of musical treatises from that period.[474]

An important text concerning this, from a work whose author is supposed to be Nicomachus, but that has been preserved in a work attributed to Iamblichus, is the

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[472] O'Meara (2007), p.150.

[473] Bower, in the introduction of his translation of Boethius' *De Inst. Musica* (1989, pp. XXVI-XXVIII), remarks that the principal sources for Boethius' treatise were, for Books I-IV, Nicomachus' lost *Eisagôgê mousikê* and for Book V, the *Harmonica* of Ptolemy. Cf. also Bower (1978), especially p.4, where the author, however, thinks the triple division belongs to Boethius and not to Nicomachus.

[474] Although *musica instrumentalis* in Boethius' classification is usually understood as referring to audible music, both instrumental and vocal, there is also a different interpretation that connects *musica humana*, the relation between the soul and the body, with vocal music (as intermediary between instrumental and celestial music). Cf. G. Reese (1940), p. 118; Ellinwood (1945), p.294 and Ilnitchi (2002) p.40.

Theologoumena Arithmeticae, 71.13 (at the end of the discussion on the Heptad). This passage gives us the key to understanding the identification voice = human speech = *musica humana*. Incidentally this text also shows a possible origin for the triadic division of Boethius in Nicomachus:

> There are 7 elementary sounds not only for human speech (*anthrôpinê phônê*), but also for the sounds which instruments (*organikê*) and the universe (*kosmikê*) make —in short, for enharmonic sound — not only because of the single, primary sounds emitted by the 7 heavenly bodies, as we learn, but also because the primordial scale among musicians has turned out to be the heptachord. (transl. Waterfield with some modifications).

The three levels of voice or sound here spoken of are human voice, instrumental sound and cosmic, which correspond to *musica humana*, *musica instrumentalis* and *musica mundana* in Boethius.[475]

The correlation between *musica humana* and vocal music is based on the inner relation between voice and the "pneumatic" nature of the soul and its vehicle, which serves to identify this kind of music with the more intimate part of ourselves. Marius Schneider has pointed out the fact that everybody feels personally engaged when singing.[476]

Music functions analogically and cures in a "homoeopathic" way.[477] Correspondingly, vocal music affects intimately the nature of the soul (its harmonic nature is what Boethius says is the object of "*musica humana*");[478] because the human voice is considered to be the "*logos*" of the soul, which announces and expresses externally what is in its innermost nature.[479]

Vocal music also had, in the hierarchical conception of the world of the Christian Middle Ages, a higher level than instrumental music, and was conceived

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[475] This text also alludes to the correspondence between the seven vowels of the Greek alphabet and the seven planets. Cf. Godwin (1991).

[476] Schneider (1998) also mentions the genre of "lied" in Romantic Germany, especially those by Schubert and Schumann, as an example of the intimate relation between voice and soul.

[477] Aristides Quintilianus gives an account of the therapeutical use of music in which he distinguishes an use "by similarity" (when one strengthens a good pre-existing habit or condition of the soul) and another use "by opposition" (when one opposes something wrong or a bad habit in the soul in order to eradicate it). He mentions also the possibility of an intermediate therapeutical procedure. See *De Mus*. II. 9, 68.22 ff.; II. 10, 73.25 ff. and II. 14, 80.10 ff. For a similar conception of therapeutic music see Iamblichus, *Vita Pyth*. ch. 25, 110 ff. and ch.15, 64 ff. on education (cf. ch. 16, 68 ff.).

[478] *Musica humana* corresponds to the relation/proportion between body and soul. The nature of the soul has been compared to vocal music, but it is also true that Aristides Quintilianus talks about an analogy between instrumental music and the nature of the human soul as well. See Barker (1989), p.492 ff. (*De Mus*. Ch. 18).

[479] The soul announces what is included in a "central" way in the *Nous*, cf. Proclus, *In Timaeum* II.243. 4-17 and also in a mathematical sense, the mathematical objects announce the Ideas (cf. Proclus, *In Eucl*.5. 2-3).

as a means of praying (Ambrosian and Gregorian Chant)[480] and an image of the Celestial Choirs of the Saints and Angels that corresponds to the Choir of the Muses and the Intellects of the Planets in the Neoplatonic picture of the world.[481] Our interpretation of *musica humana* as vocal music is coherent with Iamblichus' text, which places the song of the harmony of the spheres above instrumental and vocal music, as more complete than any human melody.

However, the text claims that is possible to achieve an accommodation even for humans (like Pythagoras, and through him, his students) with that kind of music: according to this imitation or attunement, the human melody (the soul, especially the luminous vehicle) ascends and reaches a more complete likeness to the divine melody of the Intellect as it is reflected in the cosmic music.

We can notice also that the harmony of the spheres is not the aim as such, because it is in itself another image of the Intellect. Although a more complete image than human harmony or music, it has to be transcended as well in direction to the transcendent One. For that reason, we will see higher levels of music according to Proclus.

The attunement between the soul and heavenly music is possible, in the explanation of Iamblichus and other Neoplatonists, as O' Meara has shown, thanks to the luminous or heavenly vehicle of the soul.[482]

> And if anyone had this mortal body attached to its luminous and heavenly vehicle and the senses in it purified – whether because of a good fate or a good life or, in addition to these, because of ritual perfection – he would see what is invisible to others and hear what is inaudible to others, just as is recounted of Pythagoras. (Simplicius. *In De Cael*. 469, 7-11)[483]

As O'Meara points out, the heavenly vehicle of the soul has an ethereal nature, which makes it akin to the stars. The reason why Pythagoras could hear the harmony of the spheres is because his astral body or luminous vehicle

[480] Praying with music was also known to the Orphics and Neoplatonists; see Proclus' *Hymns* and Van den Berg (2001) section on Proclus' theory of prayer, p. 86 ff. For Proclus praying is a kind of *oikeiôsis* (accommodation) to the divine and a recovering of the likeness; if this is done by singing then it is supposed that the kind of life to which one needs to be assimilated when praying is in some way musical, and if the soul needs to be associated with that life it follows that it is supposed to become harmonious as well. For Proclus, everything is a hymn or a prayer to the One and the higher principles; the spheres of the planets pray circulating around the Sun; in the same way the "whirling" dervishes pray dancing in circles. Cf. p. 260 below.
[481] On Renaissance treatises with illustrations of these correspondences see pp.144 ff. above.
[482] Cf. O'Meara (2007), p. 154 ff.
[483] Quoted and translated by O'Meara, *ibid*.

> functioning as an auditory organ, a sensorium for hearing heavenly music, remains pure, functional, whereas, plunged in terrestrial accretions, we no longer dispose of this capacity.[484]

Therefore, to recover that capacity we need to purify our vehicle of the soul. Consequently, the aim of Pythagorean music was, according to Iamblichus, to reactivate the remembrance of the celestial music through purification, imitation and contemplation. This characterization of music is in perfect consonance with the notion of assimilation in Plato's *Theaetetus*.

In Iamblichus' description of Pythagorean music, the sensible aspects of music appear as able to manifest the Intelligible, even in a more direct way than its abstract expressions; in the sense that the intelligible Harmony was present in Pythagoras' hearing and his body was in a way spiritualized. Although here Iamblichus is depicting the subtle body of the soul (and not the physical body), his theory of Pythagorean music implies that a purification of the senses and an imitation of the harmony of the spheres in a sonorous way can bring together again the Intelligible and sensible, connecting these two extremes.[485]

This shows the significant value of audible music, and of the sensible creations of art, that imitate Divine Art. They manifest in a sensible way the Intelligible according to its reflections. This kind of art is cosmic and human at the same time, and refines human nature according to its essence, which is conceived as an immanent reflection of the transcendent.

We can summarize this Pythagorean conception of music, quoting Iamblichus' *Life of Pythagoras* again, where he states that Pythagoras could hear the harmony of the spheres and that his disciples played the lyre and sang in order to purify their intellect (*to noêtikon*) and reactivate their memory. Iamblichus says also that Pythagoras, on the other hand, did not need to use these instruments for himself because he had a deeper intuitive and spiritual sense of hearing (we could call it the ear of the soul), expressed by Iamblichus in this passage that complements the already quoted ones:

> [Pythagoras] extended his ears, and fixed (*enêreide*) his intellect in the sublime symphonies of the world […] and being therefore irrigated as it were (*ardomenos*) with this melody, having the reason of his intellect well arranged (*eutaktoumenos*), he conceived the idea of giving his disciples some image of these things, imitating them, so far as it was possible, through musical instruments or the unaccompanied voice. He believed that he, alone of

[484] O'Meara, *ibid*., p.154.

[485] Hierocles too considered theurgy and telestic virtues as having the aim of "purifying the luminous/soulish body (*augoeides/psychikon sôma*)", as Schibli (2002), p. 110, explains.

> those on earth, could hear and understand the sounds (*phtegmata*) of the universe, and that he was worthy to learn from the fountain-head and origin of existence, and to make himself, by effort and imitation, like the heavenly beings; the divine power which brought him to birth had given him alone this fortunate endowment. Other people, he thought, must be content to look to him, and to derive their profit and improvement from the images and models he offered them as gifts, since they were not able truly to apprehend the pure, primary archetypes (Iamblichus, *Vit.Pyth*., XV, 65, 36,15 – 66, 37.17) (transl. Clark with some modifications from Thomas Taylor).

The hagiographic style of the Neoplatonic biography presents Pythagoras as a model to be imitated. Other people looking at him and the gifts that he possessed were benefited by seeing the reflection of the Intelligible in Pythagoras himself. His body was adapted to divine harmony (*syngeneia* and *sympatheia*), and thus being a manifestation in itself of the archetypal realm, was able to communicate a special kind of music.[486] That music was an outward likeness of the inner perception that he had. The divine power mentioned in the text, is what we have referred to previously as the "genius". Thomas Taylor translates the sentence about Pythagoras' special nature, "as being the only one on the earth adapted to this by the conformation of his body, through the genial power that inspired him".

Pythagoras appears in the extract quoted above as a soul that has ascended through music and descended again to teach his disciples and humanity what he had heard above, in the same way that the philosopher in the *Republic* leaves the cave and returns to it to awake those who remained there. Pythagoras is therefore, the living example of the imitation and assimilation to Divine harmony. In turn, cosmic music is imitated as an image with instruments and songs, and the listeners as well attain the assimilation to the Intelligible through that divine music, when they hear it by this intermediary way.[487]

In a similar way, Cicero depicts the return of the soul through music and imitation in his *De Republica*, (*Somnium Scipionis*) VI, XVIII, 18-19:

> Learned men, imitating this harmony on stringed instruments and in song, have opened for themselves a way back to this place, as have others who with excelling genius have cultivated divine sciences in human life. (transl. Andrew P. Peabody with modifications)

The disciplines mentioned by Cicero must be the four Pythagorean sciences (arithmetic, music, geometry and astronomy) that Plato also recommended for his

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[486] Pythagorean music was then conceived as a gift. The Pythagoreans, as we have seen have another gift from Pythagoras, the oath on the *tetraktys*, the source and root of divine harmony, transmitted by Pythagoras to them. It corresponds to the number 10, constituted by 1,2,3,4 that in turn compose all the musical ratios of the octave.

[487] Iamblichus goes on comparing these representations of divine music (that cannot be heard directly) in Pythagorean audible music, with the images of the sun shown in mirrors, water surfaces, etc., needed in order to make it known because it is hard to see the Sun directly, using a comparison with mirror-like images mentioned in the *Republic*.

guardians. Nicomachus called them the "four methods" (*tessares methodoi*)[488] and Boethius translated this expression as "*quadruvium*", a quadruple path or *via*, that later will be known as the *quadrivium*.[489]

In the same work, Nicomachus explained where this path leads, because he also compares the sciences to a ladder and a bridge that leads to the Intelligible.[490] In medieval representations of the Liberal Arts each science or discipline was depicted in correspondence to a step of the ladder of the spheres of the planets and as Dante explains in his *Convivio*, the importance of this symbolism does not reside in the literal understanding of the spheres as levels in the physical universe. These levels, or heavens, should be understood, says Dante, on the contrary, in an inner sense, as "*scienze*" (sciences).

Music plays a very significant role in interiorizing the understanding of the return of the soul through the spheres, and helps us to transcend the literal interpretation of this journey as merely a spatial journey. Space is transformed into music in the symbolism of the harmony of the spheres, and in this way music is able to express the transformation of the soul, that is to say, its journey of transcending spatial conditions.[491] Transcending the conditions of time is another complementary transformation that occurs with the return of the soul towards the centre of being, and this can also be expressed in music, as Wagner's opera *Parsifal* shows, especially when the music comments on the episode where Parsifal approaching the castle of the Grail says: "I scarcely move, yet already it seems I have travelled far". And Gurnemanz answers: "You see, my son, here time becomes space".

Proclus in his *Commentary on the Republic* points out that the journey of the soul takes place in the element of ether,[492] the divine container of the sensible

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[488] *Introd. Arithm*., I, 4, 1, 1 (Hoche), quoted by Hadot, I. (2005), p.67.

[489] *Instit. Arithm*. I, 1, p.9, 28 s. Friedlein. Cf. Hadot, I. (2005). p. 69 and 399. Proclus, also compares the sciences with a ladder in his *Commentary on the First book of Euclid's Elements*, Prol. II. 84.8 ff. (cf. Prol. I. 20.8 ff. and Ammonius, *In Porph. Isag*.11.23-13.7).

[490] Nicomachus, *Ibid*. I, 4, 1 and I, 3, 6 (Hoche). Boethius in his *Consolatio Philosophiae*, depicted Philosophy with a robe that has a ladder from the letter π (*praxis*) to the letter θ (*theoria*). Nicomachus also quotes the same text of the *Republic* that Proclus mentions in his *Commentary on the Alcibiades* (already quoted), about the eye of the soul, using a very similar terminology to Proclus. Cf. Nicomachus, I, 3, 7, 9 quoting Plato *Republic* VII, 527 d 7- e 3, (with the same change that appears in Proclus "*anegeirô*")

[491] Cf. *In Remp*. II.125.1-128.2, where Proclus explains in which way the journey of the soul should be understood.

[492] *In Remp*. II.132.20 ff. The ether is also understood in this sense as an intermediary "place" between the gods and the mortals, which is appropriate as the scene where the journey of the soul takes place, helped by the genius.

world, which is the medium for the diffusion of light and especially of sound. The ether symbolizes the surrounding and unifying principle of the cosmos, and music, mainly the music of stringed instruments such as the lyre, represents the cohesion given by this element. In addition, as we have seen, soul's receptivity to this kind of music resides in its ethereal vehicle.

On one hand we have an inner understanding of the return in musical terms by way of contemplation, considered as a musical assimilation of the soul's essence to a divine harmony, which has its origin in the World-Soul and the Demiurge (a harmony that is immanent to the soul). On the other hand, there is an outward way of representing the return using the metaphor of the journey which is related to space, with Odysseus symbolizing the return to the Fatherland, which is the re-establishment of the soul in its original place. Nevertheless, when the space travelled is depicted as full of music, namely the harmony of the spheres, the spatial element is more easily understood as an analogical way of representing states of being. Both representations are closely related to each other and music can be applied to both, in the sense that there is a kind of music which reminds us of the divine harmony which we had experienced in our original state or place and that is the origin of both the subjective and objective musical manifestations.

Additionally, this musical symbolic language can be employed to depict the space the soul travels during its escape from the sensible world, because musical sounds are organized as a ladder or scale, which can portray the analogical organization of levels that correspond to a vertical dimension. The vertical ladder shows the relation between metaphysical levels and the ascent and descent of the soul through those levels.[493] However, since the Neoplatonists consider this journey as a transformation of the soul, the journey cannot be literally understood as happening in space, because the ascending soul is not anymore subjected to spatial conditions. Intelligible music is found then at the top of the scale, outside the last sphere of the world, but also at its centre; the middle note (*mesê*), corresponding to Apollo, represented by the Sun, and akin to the heart of the soul and also at the heart of all the spheres.

[493] We have studied the ladder of the musical scale in the previous chapter.

Odysseus' musical journey through the harmony of the spheres and the Sirens

The musical organization of levels can be seen in the Myth of Er in the *Republic*, where Plato presents the famous Pythagorean doctrine of the harmony of the spheres, saying:

> Each of the spindle's circles acted as the vehicle for a Siren. Each Siren, as she stood on one of the circles, sounded a single note, and all eight notes together made a single harmonious sound. (617b4-7) (transl. R. Waterfield)

The inclusion of the Sirens in the Myth of Er points to a Pythagorean allegorization of the myth of Odysseus. Iamblichus gives evidence of the Pythagorean origin of the connection between cosmic harmony and the Sirens in his *Life of Pythagoras* (*Vita Pyth*.18, 82,12-13)[494] :

> — What is the Oracle of Delphi?
> —The *Tetraktys*; that is, the harmony in which the Sirens sing. (transl. Burkert)[495]

As we have stressed, for the Neoplatonists, Odysseus represents the returning soul. Consequently, if we examine the place music holds in Odysseus' return to the Fatherland, we can better understand the role of music in this return. The Sirens episode comes readily to mind. However, the music of the Sirens does not seem to guide the soul in its ascent. On the contrary, their music is a hindrance for the return. This is clear in Proclus' *Commentary on the Republic*, II.68.3 – 16:

> On one side there is the harmony that is proper to the divine and saves the souls, which is firmly established in the gods (*enidruousa tois theois*); on the other hand there is the harmony related to genesis, which attaches the souls to material things. The first is the result of the action of the Muses that educate and perfect the intellectual potencies in us, making them akin to the celestial order; the second is proper to some Sirens, and is proper to the harmonies that organize the disposition towards three dimensions in the level of *genesis*. It is clear that the Sirens preside over this kind of harmony. But he who wants to follow the ascendant path and save himself, will sail by and sail past them (*parapleusetai* cf. Plato's *Phaedrus* 259 a 7), and follow the better harmony as the true musician, but the uneducated majority will enjoy being bound by the Sirens and stay in nature and the sweetness of nature bewitched by them. (*In Remp.* II.68.3 – 16)[496]

In this text, the Sirens appear as harmful and their harmony does not lead the soul up; it can rather fascinate it in the sensible world, if their song is not seen in the vertical relation that joins it to the harmony of the Muses. Jean Pépin, however, has put forward another, more positive, Pythagorean interpretation of the myth. He portrays the Sirens as "soul guiding and helping musicians."[497] Two

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[494] Cf. Delatte (1915), p. 259.
[495] Cf. Burkert (1972), p.187.
[496] Proclus is explaining here two kinds of harmonies related to different numeric proportions presented in Plato's text about the nuptial number.
[497] Pépin (1982), p. 8; for his study of the Pythagorean exegesis see p. 4 ff.

Platonic dialogues, the *Republic* and *Phaedrus*, provide us with the key to understanding this inconsistency concerning the role of the Sirens.

In the *Republic*, the inclusion of the Sirens in the Myth of Er points to a Pythagorean exegesis of the *Odyssey*. According to this, Odysseus' journey represents the ascent of the soul through the harmony of the spheres. The *Phaedrus* also offers an explanation through the myth of the cicadas. Pépin argued that while in Homer the Sirens are presented in a negative way, as a danger which should be avoided, the Pythagorean interpretation, preserved in Plato and Plutarch, portrays them as having a more positive influence. Plutarch noted the ambiguity and he explains it according to a veiled symbolism:

> Now Homer's Sirens, it is true, frighten us, inconsistently with the Platonic myth; but the poet too conveyed a truth symbolically, namely that the power of their music is not inhuman or destructive; as souls depart from this world to the next, so it seems, and drift uncertainly after death, it creates in them a passionate love for the heavenly and divine, and forgetfulness of mortality; it possesses them and enchants them with its spell, so that in joyfulness they follow the Sirens and join them in their circuits. Here on Earth a kind of faint echo of that music reaches us, and appealing to our souls through the medium of words, reminds (*anamimnêskei*) them of what they experienced in an earlier existence. The ears of most souls, however, are plastered over and blocked up, not with wax, but with carnal obstructions and affections. But any soul that through innate gifts is aware of this echo, and remembers that other world, suffers what falls in no way short of the very maddest passions of love, longing and yearning to break the tie with the body, but unable to do so. (Plutarch, *Mor*.745 d 8 - IX.14.6 transl. Sandbach).[498]

There are two aspects that have to be considered. The first is the identification of the Sirens with the planetary music and their having the role of some kind of musical guides for the souls. The second is the necessity of sailing past the Sirens, which is expressed by Proclus with the verb *parapleô* (in the text quoted above), the same verb Plato uses in the *Phaedrus* (259a7) with reference to the avoidance of the sleepiness provoked by the cicadas, as Pépin pointed out.[499]

In this passage of the *Phaedrus*, Socrates and Phaedrus are discussing at noon, under a big tree —the symbolism of the cosmic tree plays here the role of the ship mast in Ulysess' myth— and Socrates says that they should not fall asleep under the midday sun.[500] The notion of "sleep" recalls again the state of the soul in the sensible world (and it is interpreted in this way by the Neoplatonist Hermias, as we shall see); the Sun shows the way of the ascent, as in the *Republic*[501]: in the

[498] Quoted by Pépin (1982), p.4.
[499] *Ibid*., p. 5 ff.
[500] For the identification of the return of the soul with the vertical axis (the spindle of necessity) according to the metaphor of the maritime journey see Plotinus, *Enn*. III.4.6.
[501] In the *Republic* (514 a 2 ff.) the Sun or the light is either outside the cave or comes from a fire that represents the Sun, which is placed on a high position behind the prisoners. The Sun in turn is an image of the Good.

Phaedrus it is at the top of the tree at midday and represents Apollo, the source of the Harmony in which the cicadas sing.

In this context, Plato presents the cicadas as dangerous and helpful at the same time. Dangerous for those who fall asleep, and helpful in their role of musician guides, for the souls that listen and acknowledge them as messengers of the Muses.[502] For that reason Socrates says that one needs to resist sleepiness and sail past (*parapleô*) the enchanting song of the cicadas as if they were Sirens; but then the song is transformed into a higher kind of music, that of the *anagogic* Muses.

The singing insects or birds on a tree represent the angelic voices perched on the different levels of the Universe (represented as a tree). Philo of Alexandria (*Questions and Answers on Genesis*, III.3) assigns the dove and the turtle-dove respectively to the planets and the heaven of the fixed stars.

> And both orders of the two birds are likened to the heavenly forces, wherefore, as the Socratic Plato says, it is likely that 'Heaven is a flying chariot' because of its very swift revolution which surpasses in speed even the birds in their course. Moreover, the aforesaid birds are singers, and the prophet is alluding to the music which is perfected in heaven and is produced by the harmony of the movement of the stars. For it is an indication of human skill that all harmonic melody is formed by the voices of animals and living organs through the mechanism of the intelligence. But the heavenly singing does not extend or reach as far the Creator's earth, as do the rays of the sun, because of His providential care for the human race. For it rouses to madness those who hear it, and produces in the soul an indescribable and unrestrained plesause. It causes them to despise food and drink and to die an untimely death through hunger in their desire for the song. For did not the singing of the Sirens, as Homer says, so violently summon listeners that they forgot their country, their home, their friends and necessary foods? And would not that most perfect and most harmonious and truly heavenly music, when it strikes the organ of hearing, compel them to go mad and to be frenzied?" (transl. Ralph Marcus, quoted in Godwin[503])

Philo mentions also the conception of the soul's longing for the divine music, already referred to in Plutarch's text, which is so strong that those who hear it refuse food and drink. This last aspect appears in Plato's depiction of the myth of the cicadas in the *Phaedrus*, which narrates how they were originally human beings that lived during the time previous to the birth of the Muses. When the goddesses were born they stayed amazed listening to the Muses' song and forgot to eat and died; for this reason the cicadas were granted a singing life without necessity of eating, nourished by music alone (cf. Philo of Alexandria, *On Dreams*, I,VI, 35). Philo compares the harmony of the spheres to a natural music,

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[502] The cicadas are like souls that live only with intellectual nourishment, they do not eat but sing all the time: singing is compared then to the intellectual nourishment of the souls in the meadow of truth, because they contemplate or listen to the Muses all the time (the models for their thought and also the addressees of their hymn). The singing insects or birds on a tree represent the angelic voices perched on the different levels of the Universe (represented as a tree).

[503] Godwin (1987b), p.56.

the source of which are birds, similar to the case of the cicadas. This music is identified with the human level according to the intermediary position of the soul (*logos* = natural singing voice; contrasted to instrumental music), complemented by a higher Intellectual or celestial music.

According to Philo, the divine music does not reach the sublunar world. In his interpretation the music of the spheres can not be heard for a providential reason: it is too powerful for the weakness of the human soul. The music of the Sirens is dangerous because we as human beings are not prepared —in our position in the cosmos (because of the special conditions of existence in the manifested world)— to have a direct knowledge of the celestial music. It would turn into madness if the soul did not follow a gradual approach to the different levels, starting from a therapeutic music. Furthermore, in Philo's account the music of the Sirens represents Intelligible music. But for Proclus —because symbolism allows multiple interpretations— the Sirens represent the sensible world and its charm. In *On Dreams*, I.VI.36 ff, Philo explains that the fascination comes from the Intelligible beauty and presents the example of Moses, who, like Pythagoras, could listen to this kind of music:

> If the sound of it ever reached our ears, there would be produced irrepressible yearnings, frantic longings, wild ceaseless passionate desires, compelling to abstain even from necessary food, for no longer should we take our nourishment from meat and drink through the throat after the fashion of mortals, but as beings awaiting immortality, from inspired strains of perfect melody coming to us through our ears. To such strains it is said that Moses was listening, when, having laid aside his body, for forty days and as many nights he touched neither bread nor water at all (Exodus 24.18). It seems, then that the heaven, the original archetype of all musical instruments, was tuned with consummate skill for no other purpose than that the hymns sung in honour of the Universal Father may have a musical accompaniment." (transl. F.H.Colson and G.H.Whitaker)

We can compare the intensity of divine music with that of a dazzling light, such as the one portrayed in the simile depicted by Plato in the *Republic*, when the prisoners come out from the cave. In the case of Moses both aspects are present; when he came down from the mountain he had to cover the radiance of his face with a veil, because it could dazzle the people looking directly at him (Exodus, 34:29-35). The fact that this light was compared to horns and that the sound that Moses heard in the mountain sounded like a powerful trumpet (which is also a shiny instrument) conveys the symbolism of elevation and again points to the *akron* of reality, beyond the heavens, *ta akra tou apsida* (Plato, *Phaedrus* 247a 8 and Philo, *de opif. mundi*, 71.5).

Plato's comparison of the Sirens with the cicadas is clarified in the Neoplatonic exegesis of the *Phaedrus* by Hermias. According to Hermias, Odysseus' journey is directed towards the awakening of the soul, in the context of forgetfulness of the Fatherland. Here forgetfulness is associated with sleepiness, caused by the Sirens or the cicadas.[504] Hermias says:

> Just as those, [Plato] says, who are attracted and bewitched by the Sirens forget their own fatherland, so also we, if we give in to the magic of these sights and these cicadas and are plunged into sleep, forget our own fatherland and our ascent to the intelligible (*têS eis to noêton anagôgês*). But if we awaken in ourselves discernment and vigilance, if we refuse the attraction of the sweetness of life, we sail past (*parapleomen*) like Odysseus, we avoid life here below, we become worthy of our own fatherland and of our ascent toward the intelligible. 'The gift that they have from the gods';—if, then, it were to happen, [Plato] says, that he would be able to sail past the Sirens (*parapleusai*), the Sirens who are in the sensible world (*en tô aisthêtô kosmô*), which is to say the demons who hold back souls in proximity of coming-to-be (*peri tên genesin*), then at that moment the cicadas, that is, the divine souls and the gods, seeing us revolting against coming-to-be and living like gods, would give us the greatest gift for men, which is to treat us as companions. For as the gods are vigilant in their own activity, so we also should awaken ourselves as far as possible, and it is then that we awaken ourselves, if we reactivate the reason (*logon*) which is in us. (*In Phaedrum* 259 a, p.214, 4-24 ed. Couvreur) (transl. Pépin with small modifications).

According to Pépin, this text is significant for showing the connection between the exegesis of the *Odyssey* and that of the *Phaedrus* 259a ff. Hermias shows the same ambiguity in the interpretation of the cicadas that appears in Plato's text as well. Hermias indicates that the same reality, the cicadas, can represent different things according to a change of attitude in human life, a degree of awakening that shows them in different roles: either negative Sirens or positive messengers of the Muses, being divine souls or gods themselves. The cicadas in this aspect can pass on the divine gift of companionship with the gods, fruit of an awakening and reactivation of the *logos*. Proclus identified this awakening with the influence of Hermes (as we have seen in his commentary to the *First Alcibiades*, 195-196), and in the *Odyssey*, as we have mentioned above, his gift to Odysseus of the white flower, *moly*, prevents Odysseus being bewitched by Circe, in an episode that stirs up Odysseus' departure from Circe's island, followed by the Sirens' encounter and the return to his Fatherland.

Both the Sirens and the cicadas, but mostly because of our attitude towards them and towards the sensible world in general, can have a double meaning; in their own level they represent the forgetfulness of the homeland, sleepiness, etc., but when related to their principles, the Muses, and being their images or messengers, then they can communicate a higher truth and activate a change in the

[504] Quoted in Pépin, *ibid*. p 6-7.

soul's life, being an occasion of remembering the original and divine music of the Muses. In this sense the powerful attraction of their song, can be interpreted in Plutarch's way; as a passionate love for the heavenly and divine beauty and thus forgetfulness comes to be considered a detachment from the sensible.[505] The cicadas, that at other time were humans (*Phaedrus* 259b), due to the love for the heavenly song of the Muses, forgot to eat and drink (the sensory opinion), for they had intelligible food.[506]

The Sirens, according to this exegesis, are almost identified with the Muses, in the same way as the cicadas on the one hand were seen as negative Sirens and on the other hand as messengers of the Muses. According to the *Odyssey* Book XII, Odysseus follows the suggestion of Circe that he can listen to the music of the Sirens if he is attached to the mast of the ship. If the ship represents the sensible world, the axial character of the mast should be interpreted as the path followed in the vertical ascent of the soul (that makes a way into the spheres of the Sirens), which is possible only with the assistance or spiritual influence of the gods that produces an awakening in the soul that makes it see sensible things from another point of view.

In Neoplatonism, following a Pythagorean way of thinking, there is a necessity of symbolic language to refer to a level that is higher than reason. Both mythology and mathematical sciences like geometry and music can serve for this purpose. For this reason many symbols in hieratic art are geometric, joining both mythology and geometry, such as the vertical line, or musical, for instance the musical scale or ladder that connects a hierarchy of levels. This symbolism has the aim of educating the faculty of imagination (*phantasia*) and directing it towards Intellect. Proclus says in his commentary on the *Elements* of Euclid that *dianoia* is too weak to see all the images of the Ideas (*logoi*) that it has in itself, in a unity (as

[505] On the notion of being asleep we need to take into consideration that it can be, as we have seen, in this human context, a symbol of the forgetfulness of the Intelligible, but in relation to the divine, on the other hand it can be a symbol of transcendence, while wakefulness means activity in the sensible world and providence (of the gods). Cf. Sheppard (1980), p. 66.

[506] Cf. Iamblichus' exegesis of the myth of the cicadas quoted by Hermias in 215, 12-26 Couvreur (= Iamblichus fr. 7 Dillon), also included in Sorabji (2004), p. 97. Iamblichus interprets the birth of the Muses and their song as happening symbolically at the time of the emanation of the spheres, the manifestation of the sensible world. Since the cicadas represent humans that lived before the birth of the Muses, this means that they spent time in the Intelligible realm, and when they entered into the sensible world, being "recently initiated" (into the vision of the forms), their food was the song of the Muses, which is *anamnetic* of the Intelligible, neglecting the "sensible" food, or sensory opinion.

in the *Nous*). As Lamberton explains,[507] the soul needs to turn back inside (or concentrate) and

> see the essential, non-spatial, unfragmented *logoi* that are its true substance. And this very action of the understanding would be the highest goal of the discipline of geometry, truly performing the task of Hermes' gift, liberating the understanding from a Calypso and leading it upward to a more perfect and more noetic knowledge, freeing it from the partial perceptions of imagining. (Proclus, *In Eucl*. 55.16-23) (transl. Lamberton)

Proclus mentions Hermes as conducting the soul (Odysseus) with the help of geometry; and as we have seen, he had the role of guide of the souls and also presided over the mathematical disciplines of the *quadrivium*. Proclus could have said the same about the anagogic power of music and relating it to Hermes.

We have seen that Hermias related the awakening of the *logos* with the ascent of the soul associated with Odysseus' journey sailing past the Sirens. Now, after showing the wide context of this doctrine, we can discuss Proclus' interpretation of the Sirens that combines both the negative and positive aspects explaining them as pertaining to different levels of Sirens. Proclus dedicates a section in his commentary to the *Republic* (II.237.16-239.14) to explain who the Sirens are.[508]

The first thing that Proclus mentions is the possibility of equating the Sirens with the Muses according to some interpreters, but he does not accept this explanation, for the Sirens must have a different rank in reality because they are carried in the circles of the world and there is also a difference in number that has to be taken into account (number symbolism is important). He explains that the Sirens of the *Republic* are divine souls that animate the spheres and the fact that they move in a circle manifests that "they are endowed with intellective life (*noeric*)"; because, says Proclus, Plato in the *Laws* X 897 c 4, shows that the circular movement is an image of the Intellect. Then, Proclus refers to *Timaeus* 35a 8 ff., where the circular motion of the life of the divine souls is depicted as being caused by harmonic proportion:

> if, as Plato says, their movement is harmonized, they [the Sirens] must hold in them essentially the harmonic ratios, as the *Timaeus* correctly says. And if they are carried around in circles, they are themselves some kind of circles,[509] as the *Timaeus* also says (36c

[507] Lamberton (1986), p.255.
[508] Cf. Lamberton, *ibid*. p.230 ff., for an account of this passage.
[509] Proclus explains: "If it were not a myth, it would say the rings were borne along by the Sirens, but since the mythoplasts love to turn things around, it says the Sirens are borne along by the rings (*In Remp*. II.238. 1-4, transl. Lamberton). But this is not due to a kind of perverseness of the mythoplasts, as Lamberton comments (p.230); for Proclus this is due to a natural aspect of symbolism that inverts reality as a reflection, in the same way that something reflected in a lake is seen in an inverse way. He means also the fact that it is not the soul that is in the body, but rather the body is in the soul, although sensible manifestation shows immaterial realities reflected in an inverse way (cf. *In Timaeum* I.406.30 – 407.20).

> 1). And if each of them gives a single sound (*phônê*) and one note (*tonos*) this means that they are essentially intuitive souls, that employ simple and uncompounded operations (*energeiai*); and different from our souls that employ processes of reasoning and [speculation], sometimes in a way and at other times in a different way, in order to know reality. And [again], if the Sirens compose jointly a single harmony, they make [something like a choir] around a single coryphaeus, the Soul of the [whole] World. (*In Remp*. II.238.11-20)

As Festugière remarks in a note *ad loc*. to his translation, Proclus does not depict the Sirens as "*logikai*" because they think in a rational way. His argument shows that he is opposing *logikos* —proper to the Sirens' unitive and intuitive (a single sound and a single note) way of knowing— to *sullogizesthai*, which is the fragmented mode proper to the dianoetic level of human souls, as we have seen in Proclus' previous text of the *In Euclidem*. In that text Proclus recommended a return back to the un-fragmented *logoi* of the soul, under the assistance of Hermes, in the same way that Hermias talked about an awakening of the *logos*, with the help and gift of the cicadas.[510] The Sirens of the *Republic* also possess un-fragmented *harmonikoi logoi* which reside in the *Nous*.[511] And the Sirens are unified around a coryphaeus, a head, which is the Sun as a symbol of the World-Soul. It is in this sense, because they concentrate their harmony in the World-Soul (which is a transcendent Sun for them), that they can be interpreted as beneficial musical guides, as Plutarch considered them, in an interpretation that advised to follow them and join them in their circuits, rather than avoiding them. Our souls need to imitate their harmony and with the guide of Hermes —who points the way with his vertical caduceus—, to ascend, like Odysseus after leaving the island of Circe, to higher circuits until finding the World-Soul and its Father at the top.

It is important to notice how a single voice (*phônê*) implies, in Proclus' depiction, a relation to the life of the soul concerning its more proper essence, and also the possibility of practising these harmonious sounds, because here we are dealing with a harmony of the spheres that is travelled by the souls, and not only talking about the model of harmony of the *Timaeus*. In this sense the voice of the Sirens related to vocal music is related to hieratic art, which is linked to life. The Hymns to the gods, based on the seven vowels, says Proclus,[512] sung in the opportune moment help to preserve the harmony between the life of the cosmos

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[510] It is important to bear in mind that the "un-fragmented *logoi*" of the soul are related to *logoi* in the sense of "musical ratios", which are the essential components of the soul in the *Timaeus*. Musical ratios, especially in the Neoplatonic metaphysical sense, transform the fragmented and partial realities into a harmonized whole.
[511] See Lamberton (1986), p.230.
[512] *In Remp*. II. 65.15. On the seven vowels see p. 213 above.

and human life, and the hieratic point of view surpasses the mathematical and dialectic points of view.[513] According to this, it is important to see the symbolism of a single *phônê* expressing a unitive *noeric* life (in a similar way the cicadas and the birds express living sounds, which are natural rather than instrumental sounds; see pp. 213-214 above), because we are especially in the already mentioned level of Boethius' *musica humana*. This helps us to realize the importance of the influence of *musica mundana* in our lives, according to Neoplatonism. Proclus emphasises the fact that in the *Republic* both cosmic life and human life are intimately related, and this is symbolized with the musical harmony between the cosmic cycle and the cycle of the life of the souls, and the corresponding legislation and education needed to recognize and preserve this attunement for the harmonious existence of human society, which appears in the section of Proclus' commentary on the *Republic* known as the "Bee" ("*Melissa* on the discourse of the Muses").[514]

There is no harm in repeating that this symbolism is not artificial or extrinsic. For Proclus and the Neoplatonists the same principles can reappear under different modes at different levels. One can say that musical harmony symbolizes the health and good order of a community, but in reality, that level or kind of harmony is another manifestation of the principle of all music. In the same way the cosmic rhythm that the sunflower or heliotrope follows during the day is another manifestation of the harmonic cosmic life, and as Proclus says, its little petals sing a hymn of praise to the Sun (it does not *represent* a hymn of praise, it *is* a hymn)[515]. Therefore when Proclus says that the flower sings, metaphorically according to our human language, it should be understood as meaning that the flower is, in a metaphysical language, a manifestation of the Sun's light and in itself a hymn of praise in the mode of a flower. The sunflower even has the natural corresponding colour of the Sun, yellow and with petals that resemble the Sun, which it follows during the day (being a natural symbol of *epistrophê* and assimilation to the principle).[516] Proclus mentions the sunflower, therefore, because it has the importance of a model for a kind of life: it is recommended to

[513] Proclus, *In Remp*. II. 64.5-66.21.
[514] Proclus, *In Remp*. II.1.4 ff. Cf. Sheppard (1980), p. 204.
[515] Proclus, *On the Hieratic Art* (*De Sacrificio*), 148.10. Cf. Siorvanes (1996), p. 128 and Shaw (1995), p. 48. See pp. 55 above and 260 below.
[516] The Neoplatonists also considered the colours in a symbolic way too, usually mentioned as seven or six colours of the rainbow and white, and in relation to other groups of seven (i.e. planets, musical notes, vowels, etc.). Cf. Godwin (1991), p.35 ff.

follow the example of the flower according to the mode appropriate to the human level and realize the flower within (the "flower of the soul").

To return to our topic and complete our study of Proclus' interpretation of the Sirens, we can quote a last text from his *In Remp*. that shows in a clear way the different levels of Sirens and explains why there is no inconsistency in considering the Sirens both an obstacle and guidance in the journey of the soul:

> Plato called them 'Sirens' to indicate that the harmony they impart to the rings is always bound to the material world, but he called them 'celestial Sirens' in order to distinguish them from the Sirens within *genesis*, which he himself elsewhere agrees that Odysseus sailed past, as in Homer's story [*Phaedrus* 259 a]. These last Sirens, however, proceed from the dyad, for the poet uses the dual to refer to them as if there were two of them. The poet says: "the voice of the two Sirens". The others, however, proceed from the monad, for the one that presides over the unitary circle, the outermost circle, leads the hebdomad. Thus it is entirely fitting that an appropriate quantity be spread below this dyad, and if the celestial monad is followed by seven, then the dyad that generates the world of change (*genesis*) must have twice seven, and often the Theologians multiply the zones of heaven by two in the sublunary zones. There are likewise Sirens in Hades, which he clearly mentions in *Cratylus* [403 d 8 ff], saying that they will not leave Hades because they are bewitched by the wisdom of Pluto.
> Thus there are three classes of Sirens by Plato's own account: the celestial ones belonging to Zeus; the ones that function in this terrestrial world belonging to Poseidon; and the subterrestrial (hypochthonic) ones belonging to Pluto. It is common to all these kinds to produce a physical harmony, tied to the order of the corporeal, for the Muses are specifically granted the intellective (noeric) harmony (*noera harmonia*). This is why they are said to conquer the Sirens and crown themselves with their feathers, for they are uplifting principles (*anagogic*) for the Sirens, and attaching them, the Muses fasten the anagogic potencies with which they are endowed with their intellective activity. (*noesis*)." (*In Remp*. II. 238.21-239.14) (transl. Lamberton with modifications)

The anagogic power of the activity of the Muses is clearly stated, together with the association between the Muses and the Intellective Harmony. The Sirens have anagogic power *in potency*, the Muses on the other hand, being harmony in relation to *noesis* possess this quality *in act*. In the context of this interpretation, then, it is clear that the fragmentary harmony of the sensible Sirens —presided over by the dyad— must be transcended in the direction to the celestial Sirens. The celestial Sirens comprise a hebdomad plus a monad, which is a multiplicity held in harmony and better adapted to the unity of the Intelligible because they are presided over by the monad and in a way forming a choir around the World-Soul. The Sirens in this sense are in the same chain as the Muses. The Muses are crowned with their feathers and are the source of elevation and transcendent unity for them. Also, feathers are usually an anagogic symbol in Platonism.

The value for the human soul that listens to the harmony of the Sirens is that their chain of participation can transmit the anagogic power of the harmony of the

Muses to the soul, if it attaches itself to the vertical ascent through the spheres, in the appropriated order of the hierarchy or ladder of existence.[517]

The double meaning of the Sirens is explained in the frame of the analogical system of Neoplatonism or Pythagoreanism. Music and harmony have different levels, the same as Beauty in Plato's *Symposium*; the sensible levels have an important meaning to convey but they are not the end of the journey and they can become idols. On the contrary, the danger of idolization is overcome when the soul attaches to the Absolute and fastens its essence to the immobility of the principles, whose causality is symbolized with the vertical axis of the world (the tree where Socrates talks with Phaedrus at noon; the occasion of noon with the Sun at the top of a tree shows the same aspect of verticality in the *Phaedrus*, as we have already mentioned). Similarly, Odysseus tied at the mast of the ship can and must listen to the song of the Sirens because now for him it is a "symbol", an anagogic support and not a hindrance any more. For others, without the point of view of the principles (the vertical sense) it is just an occasion for sleepiness and a veil (like those who listen to the cicadas in the *Phaedrus* at noon) or deafness, like Odysseus' companions with their ears covered with wax. The sensible can be either noise covering the intelligible song, or on the contrary can be a foresight (prefiguration) of divine Harmony. It is interesting to notice that both images (the Sirens in the *Republic* and the cicadas in the *Phaedrus*) are related to listening to a divine song that originates from the Muses. In the second case, Plato explicitly mentions that the cicadas are messengers of the Muses and can grant to human beings a gift from the Muses.[518]

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[517] Clement of Alexandria says: "Pythagoras advises that is better to enjoy the Muses than the Sirens, and teaches to practice wisdom, not from the pleasant, rejecting unreservedly as deceitful its enchantment." (*Stromata* I, 48. 6)

[518] The cicadas sing mostly during summer and they are considered in the context of theurgic symbolism solar insects, devoted to Apollo. Cf. the legend of Eunomus who was playing in a contest at the Pythian games against Ariston, and when one string of his lyre broke, a cicada lit on his lyre and supplied the sound (Cf. Strabo, Geography, 6.1.9, Loeb Classical Library, Vol. III, transl. H.L. Jones). This illustrates also the natural character of the music of the spheres that is due to divine voices, in contrast to the artificial origin of instrumental music (Clement of Alexandria, *Protrept*. I, calls the song of the cicadas in Eunomus' legend, a natural song in praise of God, in contrast to Eunomus' own song). The singing of the cicada also suggests the singing of one note of the Sirens in the *Republic* (a single sound each). We have seen that the single voice of each Siren represents a divine soul. The simplicity of sound is higher than multiplicity and represents the *noeric* capacity of intuition.

The four levels or kinds of music

Proclus' distinction of levels of Sirens should be considered in the wider context of the classification of four levels of music, in his *Commentary on the Republic* (I.56.20 - 60.13). Each level or kind (*eidos*) of music is explained according to a particular Platonic dialogue.[519]

1) The first level of music is identified with Philosophy as the highest *mousikê*, according to *Phaedo* (61a3). It can be called "science of love" (*erotikê*), for it corresponds to a unitive knowledge related by Proclus to Apollo. Proclus says:

> We say that philosophy is the highest *mousikê*, as if you wanted to call that music that is most uplifting with love (*erôtikôtatê*) the "science of love" (*erôtikê*). This music harmonizes not a lyre, but the soul itself, with the most beautiful of all harmonies (*Lach*. 188d3), through which the soul is able to put in order (*kosmein*) all human things and celebrate the divine in a perfect way, imitating the Musagetes, who on one side celebrates his Father with intellective hymns and on the other keeps the whole world together (*synechei*) with indissoluble bonds, "moving together" all things, as Socrates says in the *Cratylus* (405c6). For this reason Plato says willingly that music inspired by the gods (*entheon*) is eminently present in the philosopher (it is well known that the common people see the philosophers as possessed by the gods), and all the goods of the educative music are present in him in the more absolute sense, and finally everything good that we have in mind when we consider that music is worth eagerly dedicating ourselves to. The summit of the dedication to music (*akrotatos tôn mousikôn*) corresponds to this level, and is proper to the true philosopher and this kind of musician lacks nothing of the true goods that are proper to music. (*In Remp*. I.57.8 – 23)

Proclus' scheme supposes a correspondence of kinds of life, kinds of music and poetry. In Plato's *Phaedrus* (248 d 3, e 1 ff.), the musician is presented together with the lover and the philosopher as belonging to the first type of life. The highest level of music corresponds analogically to the One (the Father), where philosophy, love and music are unified. However, since the One is transcendent simplicity, higher than harmony and music (symbolized in a way with Silence = *siôpê*)[520] we can say that the highest level of music is akin to the One as its *akron*, or summit, from the perspective that this music is directed to the closest attachment to the One, which is what gives unity to everything that exists. In a vertical way, the *synecheia* of everything connects all the levels to the One as source. At the same time, everything is "moved together" and each level in a

[519]Sheppard (2005) has studied this classification in an article called "Music therapy in Neoplatonism".The correspondences between levels and Platonic dialogues are not shown in all the cases, but even the level of scientific music, which is not correlated explicitly, can be traced to Plato's *Republic*. Cf. Sheppard, p.149.

[520] Cf. Plotinus, *Enn*. VI.8.11.1 and III.8.4.3. The aim of music is to prepare the harmony of the soul, to be able to receive that silence, in the same way that the soul needs to become a smooth, bright and calm surface, like a lake or a mirror, for being able to receive the projected illumination of the Intelligible (Plotinus, *Enn*. I.4.10.9-90). Music is the brightness of silence that prepares the receptivity and manifestation of that silence.

horizontal way is organized in a proportionate and harmonious way, turning around a centre. Thanks to Apollo the One is present within multiple realities as harmony. Proclus refers this conception to Plato's *Cratylus* (405c) as well (cf. *In Crat*. 174-176), and it could also be related to the *Theaetetus* (153c – d) where the golden chain (another symbol of the universal *synecheia*) is again connected to the Sun as the cohesive force in the universe. Apollo is a transcendent Sun, but with his rays and illumination reaches everything immanently, sowing in the heart of everything a spark that longs for returning to its source.

Proclus mentions as well that the musician at this level has tuned his soul like a Lyre (referring to *Laches* 188 d 3), imitating Apollo who is the god that holds the cosmic Lyre, which has a tension that connects the strings with the resonance box (here resonance is another symbol of the *synecheia* and *sympathy* of the world).

In this sense, music as philosophy is an intuition of harmony as Unity and the philosopher is the one who can see the unity in multiplicity and consequently tries to attach his life to that Unity (represented in the tuning of the soul as a lyre in the Dorian mode).

2) The second level of music is defined by Proclus as the inspiration that comes from the Muses. It is called inspired music and corresponds to inspired poetry in the *Phaedrus* (245a). This kind of music stimulates and puts the soul in motion towards divine inspiration; or it would be more correct to say, that it orientates the soul making it receptive to the Muses, because "this inspired music", says Proclus, "produces the poet possessed by the gods". At this level of music the art of the musician is identified with the art of the poet, for "inspired music (*entheos mousikê*) is what brings the inspired poet to perfection". This level is still higher than reason, because it is identified with inspiration. Inspiration is a presence of the divine; therefore it is higher than participation in the forms, mediated through the Intellect, because it connects the soul directly with the One that is higher than Being and Intellect.

The educator, the musician (and the poet), the lover, and the philosopher, etc. are all related more to inspiration than to discursive thought in the first place; later in a following stage they can teach, compose and love in a more rational way. These kinds of "activities" are related to inspiration in the *Phaedrus*, as is well known. Concerning the relation between love and education, Proclus gives the

example of Socrates as the true lover of Alcibiades (divine inspired lover), identified with the genius. The reception of the inspiration is depicted as hearing.[521]

This kind of music has an important capacity to educate, by means of particular example.

3) There is a third type of music, which we consider as related to the level of music as a science of the *quadrivium*. This type corresponds to the second stage in Platonic education in the *Republic*. Proclus describes it in the following text:

> Then he also talks about the third kind of *mousikê*: this one is no longer inspired, like the one mentioned before, but nevertheless it leads up (*anagôgon*) from perceptible harmonies to the imperceptible beauty of the divine harmony. For this kind of *mousikos* too loves beauty, just like the lover, although the latter is reminded of beauty by means of sight while the former is reminded by means of hearing. (*In Timaeum*, I, 58,27 ff.) (transl. Anne Sheppard)

This music shows in the manifested world the principles of harmony, and the soul that experiences it needs to refer back the effects to their causes. It is related to intelligible beauty but not any longer in the sense that it is inspiring a love for beauty that unites the soul in its inner life and concentrates it in a state of attraction and desire, etc. Now it corresponds to Being and Intellect as they are present in the Soul according to a reflection in its "scientific" activity. Science in the soul is speculative (as in the case of *musica speculativa*) because of being a *dianoetic* mirror of the intuitive knowledge of the *Nous*. Accordingly, music is not only art, it is a science too.

The previous levels were related to Apollo and the Muses, sources of intelligible light represented with the Sun. Here, in the level of science music is Lunar and mirror-like (mental, no longer intuitive), and the soul is able to see in the reflections, in the veils, a transparency of the archetypes, hence the anagogic character of this level of music.[522]

In the Chaldean order of the planets, Hermes (Mercury) comes next after the Moon and is the link with a re-orientation and elevation towards a higher level of inspired Solar music (Apollonian). Aphrodite (Venus), which comes after Hermes, provides the aspect of the desire of beauty. Proclus connects these three planets, the triad of the *Philebus* 64c (Truth, Beauty and Symmetry), the types of life in the *Phaedrus* 248d and different forms of madness and inspiration

[521] Cf. Proclus, *In Alc.* 40.10 ff. and 41.19 ff.
[522] Cf. *In Timaeum* II 246.4-9, where Proclus says that Plato used mathematics as veils of higher truths.

(*Phaedrus* 244-5).[523] We cannot extend here a comparative analysis between Proclus' three levels of poetry and the four levels of music, and how these three levels correspond to the three *maniai* of the *Phaedrus*. It is difficult to apply the same scheme to music and poetry, because here there are four levels of music and in the section on poetry (*In Remp*. I.177.14-178.5) there are three levels of poetry that correspond to three levels or types of life. We can say that the three levels of poetry —inspired, didactic, mimetic— correspond in turn to the levels of inspired, scientific and therapeutic music.[524] However the levels of music are more like the aim and the leaders of their corresponding poetic kinds. Inspired music leads inspired poetry to perfection and the same happens with the other two: scientific music shows the way to didactic poetry and therapeutic music helps mimetic poetry in detaching from the sensible.

This hierarchic anagogy arises from the fact that Apollo and the Muses are the sources for the poet and also because music is considered as more spiritualized than poetry, as its soul or inner side that connects the sensible harmonies with intelligible and divine harmonies. Music, in its wide sense, therefore is a higher step than poetry, summoning it up, and for this reason the types of poetry and types of music do not match in a straightforward way.

As we said, Proclus also refers to the types of life of the *Phaedrus* (248 d 3) where the musician is presented together with the philosopher and the lover as belonging to a first type of life, while the imitative poet corresponds to the sixth type, as can be seen in *In Remp*. I.57.1 ff and in the following text:

> He [Plato] mentions three kinds of persons who had chosen a kind of life that is elevating and which returns (*anagôgon kai epistreptikon bion*) starting from the last levels and directed towards the primordial ones, from where they have descended; and these persons are the philosopher, the lover and the musician. (*In Remp*. I.59.4 ff)

Even though the 3rd level is a lower kind of music than the two previous ones, still its function is to elevate to divine harmony. Love here is anagogic, while in the previous level it was unitive; the intellectual activity of the soul leads up to its object, ascends to a unitive life (in the second level of music) towards the paradigm of Unity (in the first level of music). We have then the progression

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[523] Cf. Sheppard (1980), pp.100 ff; and Proclus, *In Remp*. I.178.26-179.3; *In Timaeum* III. 66. 13-22; III.69. 10-14.
In these correspondences the World-Soul corresponds to the Moon. Cf. Dillon (1973), p. 357.
[524] Cf. Sheppard (1980), p. 95 ff. and 162 ff.

Being, Life, Intellect mirrored in these three first levels of music (or Father, Mother, Son: Cronos, Rhea, Zeus).[525]

Truth	= Apollo	= *Highest mousikê*	= Kronos
Beauty	= Aphrodite	= Inspired music	= Rhea
Symmetry	= Hermes	= Anagogic music	= Zeus

We need to consider that these levels are levels of music as they reach the soul, and correspond to kinds of life, philosophical life, inspired life, scientific life, etc. The first level is a hymn to the transcendent Father, its aim is the One and true Being (as the first phase of the intelligible triad). The second level is more a descending inspiration, a presence in the life of the soul of an intelligible life and light that fills everything (corresponding to the overflowing *Krater* of the *Timaeus* and Rhea or Hecate); in this sense, if we understand inspiration as descending and following a procession that overflows like a fountain, then the second level is still not the return or limit of the procession. But at the same time if we consider it as the circular dance of the Muses and their anagogic light, transmitters of *anamnêsis*, etc. (as we have seen in Proclus, *Hymn to the Muses*), then the level of inspired music is already related to conversion (the Muses dance in a circle: in this context the second level is already anagogic and turns around the source and leads up towards it). But properly the level of conversion is the third, that comes after the division of the unity of life according to the forms in the Ideal Living Being (*Timaeus* 39e – 40a), that corresponds to the proper Demiurgic activity, which divides the mix of the soul according to musical proportions, studied by the science of *Harmonics*, and that corresponds in turn to this level of music. In a Pythagorean/Neoplatonic language the first three levels correspond to a) *Peras*, as transcending Essence and Truth, b) *Apeiron* as divine Infinite Possibility and Beauty and c) *Mikton* as Harmony and Principle of created manifestation according to proportion and return. They also correspond to a) Paternal Intellect, the centre of all music, b) Source of Life, the origin of musical procession and love of beauty and c) Demiurgic Intellect, the creative principle that manifests the

[525] This triad is also related to another triad: permanence, procession, return and also with *peras*, *apeiron*, *mikton*. Cf. Proclus, *Theol. Plat*. III.9.135 (p.35); also considered as summit (*akron*), middle, and lowest limit of being. For the triad, Kronos, Hecate, Zeus or Paternal Intellect (transcendent), Rhea, fountain of life and Demiurgic Intellect (provident), see Van den Berg (2001), p. 253 and Proclus, *Theol. Plat*. V.11, p. 36, 12-17. Cf. also Sheppard (1980), p. 65 for the relation between this triad and its poetic symbols.

previous principles in music, both in an inaudible and subtle first manifestation (harmony of the spheres) and audible (sensible) music.[526]

The Demiurge produces on one side harmonic division and on the other harmony and unification; the soul then, mirrors these two processes and after division needs conversion towards Unity and anagogic music. This *anagogy* is achieved by means of a study of the intervals in a Pythagorean and mathematical way and leads up to the paradigms of harmony. This kind of science is also a type of love, because it is not an abstract and cold activity; it still has a reflection of the fire of harmony (in a Chaldean sense, because these sciences correspond to the levels of the planets, and the Sun of Arithmetic is in the middle of all of them).[527]

4) Proclus then continues with the fourth type of music:

> Finally he [Plato] talks about another kind of *mousikê* in addition to these, one which educated the character by means of modes and rhythms which lead to virtue, discovering which modes and rhythms can educate the passions of the soul and mould them with excellent character traits in all actions and circumstances, and which ones, opposite to these, put the souls out of tune by tightening or loosening them and leading them to disharmony and lack of rhythm. (*In Remp*. I.59.20-27)

This type corresponds to that music which belongs to the first stage of Platonic education in *Republic* III. This level corresponds to therapeutic and educative music, which is the sensible music that we are acquainted with since childhood. This kind of music is responsible for the formation and nourishment of the *thymoeides* part of the soul, which is in the middle between the passions and the *dianoia*, therefore, appropriated for leading the soul up, together with imagination. We refer to Sheppard's article[528] for a detailed treatment of this level of music.

Proclus' distinction of different levels of music can be appreciated in the following diagram:

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[526] Cf. previous note.

[527] Cf. Brisson (2000), pp.124 ff. Fire is related to love and to the cohesion of the world; fire and love connect everything to the intelligible light of the Father. Cf. *In Timaeum* II. 54.10-16, where Proclus says that this love is what makes it possible that the elements of the world (the planets and stars) keep their course. Cf. also Aristotle, *Met*. 1072b4, on the Unmoved-mover that *kinei hôs erômenon* (by being an object of love).

[528] Sheppard (2005), p. 149 ff.

Diagram 9: Levels of Music in Proclus' *Commentary on the Republic*

One……..Apollonian Music/Philosophy…….Apollo (number 1)

Noûs……Noetic Music/Inspired Music.....The Muses (number 9) — Divine

Soul……..Scientific Music..……Hermes (number 4) — *Musica Mundana*

…….Cosmic Sirens — Cosmic

(Plato's Sirens/Myth of Er = 8 in number)

(The *noûs* in the human soul/Logos illuminated by the *Noûs*
Hermes guide of the soul, anagogic music, *Quadrivium* and
mathematical sciences of *Republic* VII that kindle the eye/ear of the soul.) — *Musica Humana*

Body and Soul ……Educational music/therapeutic music (purificatory)

……..…….…….Sublunar Sirens — *Musica Instrumentalis*

(Homer's Sirens/Odyssey = 2 in number)

Each Boethian level in this diagram spans more than one Proclean level (e.g. *Musica Mundana* covers both Noetic Music and Scientific Music); this is mainly due to the analogical character of Proclus' philosophy, in which each superior level is mirrored in the following inferior level, in the hierarchy of reality. In this way all the levels are unified in a continuous mirroring chain. *Musica Instrumentalis* appears at the bottom of the diagram; however, this kind of music can serve as a symbol of the highest levels of being at the same time.

We would like to come back to the third type of music that we call anagogic. Although Proclus does not mention this explicitly, it can be assumed that it corresponds to the mathematical science depicted in *Republic* VII because he says that this music goes from the perceptible harmonies to the imperceptible beauty of the divine harmony, which is what Plato expects from the sciences of music and astronomy, in order to be able to lead the soul to the Intelligible. This scientific music is not the highest kind of music. It is the type of music that leads the soul on its way, as conducted by Hermes and his Hermetic sciences.[529]

We have seen that Hermes represents the *logos* as a divine principle, always illuminated by *Nous*. Our reason needs to imitate that Hermetic reason which is always in contact with the *Nous*, because the *Nous* corresponds to something that is more than rational.

Proclus shows in his commentary on the *Parmenides* that the *Nous* is higher than discursive reason, and depicts the return of the soul in terms of a sea journey, connecting the myth of Odysseus with levels in a hierarchy of knowledge:[530]

> So then, many are the wanderings and whirlings of souls. There is one at the level of imagination, another above this at the level of opinion, another again at the level of discursive intellect. Only life according to intuitive intellect possesses freedom from wandering, and this is the mystical mooring-place of the soul, to which the poem brings Odysseus after the multifarious wanderings of his life. (*In Parmenidem*, V, 1025, 29 ff, transl. J. Dillon)

Proclus, as the context of this quotation shows, interprets that the soul (represented by Odysseus) needs to fasten upon the causal principles of things — he uses the expression (*ephaptontai têś aitias*)— and transcend sensations, images, opinions, sciences and discursive reason to arrive at an intuitive life that corresponds to *Nous*. We can see in this passage a progression of the soul's faculties that follows the same direction as the levels of music depicted above.

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[529] But Hermes represents the gift of memory and rational thought that is directed toward a higher reality that is more than rational. Hermes always reverts to Apollo or Zeus, he is the soul as long as it is returning. But if the soul doesn't follow him and his sciences understood as anagogic, then the soul stays in the world with a science fascinated by the sensible, which is something like staying tied to the Sirens and Circe, in the level of sense perception.

[530] The first stage in this return is to recognize that the senses are able to know nothing accurate; the second stage is to give out thinking through images; thirdly we must get rid of opinions and "the 'wandering' around them in which souls are involved; for they do not fasten upon (*ephaptontai*) the causal principles of things, nor do they implant in us knowledge or participation in the transcendent Intellect.

Proclus concludes the section of his *Commentary* about the types of music with a strong affirmation of the anagogic character of music. This art, he says, is able to transcend art as mere imitation, showing that it is truly a sacred art, which exercises important influence in guiding the soul to the primordial reality:

> The higher kind of life corresponds to this [higher] kind of music and Plato separates it from poetics, because poetics is proper to imitation, and this kind of music cannot follow an imitative life staying at this level with copies; but music prefers to snatch itself out (*anharpazein*) of copies in order to ascend towards the divine models of harmony and rhythm for all in this world. (*In Remp*. I.60.6-13, my transl. following Festugière's p.77, vol. I).

Imitative poetry copies sensible reality and the poet creates a composition imitating the sensible manifestation of things. On the other hand, what music takes as a model are divine models of harmony; music is essentially a symbolic art and expresses the universal inner side of things instead of their appearances; music is also a mathematical science, and as Plato and Plotinus say, the musician stirred by sensible beauty and harmony is led to the model of this beauty: Intelligible harmony.[531]

Proclus mentions also the concept of kinds of lives (Plato, *Phaedrus*, 248d-e), i.e. life according to intuitive intellect and the other levels that gradually proceed from this one or return to it. As we have seen above, it is difficult to apply the same scheme to the four levels of music, the three kinds of poetry and the three types of life. Nevertheless, as we mentioned before and since this text also allows us, we can say that Proclus' account of the different kinds of lives can be harmonised with the levels of music as well. The higher kind of life puts the soul in contact with the gods, and makes the soul live according to a higher likeness and kinship with the gods. It is an inspired life that corresponds to an inspired poetry. The intermediate life corresponds to reason and science, and to a kind of poetry connected to science and understanding. The lower kind of life and the analogous third level of poetry is that one that deals with irrational sensations, imagination and opinion and it is imitative in an inferior sense (this corresponds to the fourth level of music).

[531] On the difference between imitative representation and symbolism in Neoplatonism, see Sheppard (1980), p. 76. The source of the doctrine of art as imitation is *Republic* X (595a-608b). However, Plotinus tried to modify this doctrine explaining that the artist imitates not the sensible world but the Forms (V.8.1 and I.6). As Sheppard points out (p. 196), according to Plotinus there is a level of poetry, inspired poetry, "which represents the divine world not directly, by imitation, but indirectly, by symbolism". Proclus developed the distinction between *mimêsis* and symbolic representation (e.g. *In Remp*. I.198.13-9) and applied it in his classification of levels of poetry.

If we apply the four levels of music already quoted; namely, 1. philosophical, 2. inspired, 3. anagogic and 4 educational; to this classification of types of poetry and life, we can say that the fourth level of music assists the soul in purifying its life according to passions and irrational sensations, the intermediate level (anagogic) corresponds to a scientific music (Hermetic) that leads the soul up through music as a science, and orientates the soul in a way that makes it able to receive the inspiration of the Muses (the level of inspired music), that is more than rational and belongs to the highest type of Poetry and Life. The first level of music, the philosophical one, is the highest manifestation of the principles, even above inspired poetry and music, and puts the soul in contact with the Apollonian music that is the source of all harmony and light. This level is only mentioned in the section of Proclus' *Commentary* on music, but not in the section on poetry.

Music expresses a symbolism by means of sounds and inspired poetry can use words in the same way. At the same time, music is closer to the non-discursive and unitive character of the First Principle; on the other hand, although poetry at its highest level can use words in a non-discursive way (inspired symbolism), it is still tied to a discursive thinking and involves reference to things other than itself. The highest level of Music (identified with unitive —erotic—philosophy) is non-discursive in a deeper sense than the highest level of poetry and can untie itself from that reference to otherness and become "unification with the Father", in an absolute and non-other-referring way.

Therefore, we could say that there is no poetry at that level of "philosophical music", or that poetry at that level becomes something else, in the same way that manifested music is transcended in Apollonian music. Proclus mentions this level of highest light again in connection to Odysseus' journey in the *In Timaeum*:

> For after the wanderings in the world of becoming and the purification and the light of knowledge (science) (*epistêmê*), the noeric activity finally shines out and so does the *nous* in us, which moors (*hormizôn*) the soul in the Father and establishing (*enidruôn*) it in a pure way in the demiurgic intellections and linking light with light, not something like the light of knowledge (*epistêmê*) but an even more beautiful, more noeric and simpler light than that. For this is the paternal harbour (*ho patrikos hormos*), finding the Father, the pure unification with him." (*In Timaeum* I.302.17-25, translation R.M. Van den Berg).[532]

We can see the different levels mentioned before, 1) sensible (imitative poetry, sensible music) and purification: (music as therapy); 2) knowledge (music as science); 3) noeric activity that shines (illumination = inspiration; inspired music;

[532] Quoted in Van den Berg (2001), p.51. Cf. *In Parm*. VII, 1171.6 and Brisson (2000), p.124.

the *nous* in us), and 4) the *Nous* established in the Paternal harbour (music as philosophy).[533]

Proclus uses here the metaphor of light but as we have seen in his *Commentary on the Republic*, the music of the Muses also establishes the soul on the divine level. Since Apollo is a god of both light and harmony, then both kinds of symbolism, the visual and the acoustic, can be applied. Proclus connects these two aspects in his *Hymn to the Muses*, already quoted above. We emphasise vv. 1-5 that mention the

> light that raises (*anagôgion*) man aloft, the nine daughters of great Zeus with splendid voices (*aglaophônous*), who have rescued […] the souls who were wandering in the depth of life, through immaculate rites from intellect-awakening (*egersinoôn*) books. (transl. Van den Berg)

Proclus continues (vv.12-15) with a petition to the Muses

> that the race of men without fear for the gods may not lead me astray from the most divine and brilliant path with its splendid fruit (*aglaokarpou*). Always draw (*helkein*, *Republic*, 533d 2) my all-wandering soul towards the holy light, away from the noise of the much wandering place of generation (genesis) (*homadoio polyplanktoio genethlês*).

We can notice that the metaphor of wandering in the sea and the return to the safe port is always present. The paths of harmony are brilliant and splendid —as marked in the heavens—, showing the soul, who watches the stars above, the course that should be followed.

Numenius compared the Demiurge with a pilot in the ship that contemplates the sky to find the orientation:

> A pilot that sails in the open sea, sits in the castle of the stern and conducts the ship with the helm, but his eyes and mind are strained directly (*syntetatai*) at the ether, looking at things aloft, as his course passes across the heaven above, while he sails upon the sea below. So also the Demiurge having bound matter together in harmony that it may neither untie nor drift away, is himself seated (*hidrutai*) above matter, as above a ship on the sea: and he leads the harmony steering it with the Ideas, while instead of the sky he looks to the High God who attracts his eyes, and takes his judgment from that contemplation, and his impulse from that desire. (Numenius, fr. 27 Leemans, Eusebius, *Prep. Evang.*, XI, 18) (transl. E.H. Gifford with modifications suggested by the Spanish transl. by F. García Bazán)

Harmony is the course of the world, it is what unifies and gives cohesion to everything and its orientation comes from the contemplation of the Intelligible. In this text also appears the notion that the harmony of the world depends on an intelligible model; a characteristic that can be applied also to human society, which is also compared to a ship in Platonism and also to the human soul, which

[533] Cf. Proclus, *In Parm*. IV, 949.14 ff., text quoted and commented by Van den Berg (2000).

possesses the same inner harmony and that is also steered from the stern, which corresponds in the soul to the *hêgemonikon* and the already mentioned genius.[534]

Divine harmony is also the paradigm for the Demiurge in the *Timaeus*, who creates the World-Soul and the World as a harmonic whole thanks to proportional divisions and bonds. When Plato depicts contemplation, both through Astronomy and Harmonics, at the end of the *Timaeus*, he presents these activities as part of the gradual ascent through steps toward the Intelligible (by means of discursive thought), and the sciences as a mirror of the true unitive contemplation that has its paradigm in the contemplation of the divine model by the Demiurge (in Orphic mythology Zeus contemplates the Night and gets advice from her).

The proportions that the Demiurge uses in the *Timaeus* are related to the Hebdomad and the journey of Odysseus through the harmony of the spheres and the Sirens traverses another hebdomad (the seven spheres of the planets) in his ascent. Consequently, we need to refer briefly to music and the return of the soul in relation to this hebdomad and not only in relation to number four (the four aforementioned levels of music).

Proclus mentions in his *Commentary* (*In Remp*. II. 190.28 ff.) that the number of days that the souls spend in their journey is related to the Hebdomad, which according to the Pythagoreans, says Proclus, was connected to the moment of opportunity (*kairos*) and the seven ages of human life.

Music and the astral origin of the soul and its return through the seven-steps ladder of the spheres of the planets

The ascent of the ladder of seven steps is a *locus communis* in Pythagoreanism, Platonism and Hermetism. As we have seen, in the *Timaeus* 41d ff., the previous and original state of the soul is identified with a star (akin to the soul). We have quoted also Proclus' *Hymn to the Muses* where he says that the Muses help the souls to return to their star. Since the descent of the souls involves the conditions of time and space —or it opens the possibility for these categories—, it is depicted analogically as a journey; the return conversely requires a process in time of recovering/realization of the soul's essence (which is of course pursued starting from the present time and place). This process is related in Neoplatonism to the need of *anamnêsis* and education.

[534] Cf. Proclus, *In Alc*. 281.17 and pp. 250 ff. below.

If the heavens are in some way harmonized in a musical manner, then the soul must sound together in a *symphonia* with that higher music in order to return there and assimilate to that celestial harmony. We have seen the importance of the role of the genius in Platonic education. If our "genius" stays in the heavens which are full of music and we need to "harmonize" our life with its life and allow the inspiration of the genius to come to reside in our soul, we can see why the levels that are in between our terrestrial life and our "genial" life need to be connected as in a musical scale.[535] Our explanation employs the language of the Plotinian doctrine of the "undescended soul", to express the mediation of music in the process of assimilation between the intelligible and empirical man (or self). However, Iamblichus and Proclus do not follow Plotinus on this. Plotinus stated that the soul's life coexists with a higher kind of life, because it has not descended completely, a "part" of the soul stayed in its celestial habitation.[536] Proclus, in contrast to Plotinus, remarks that the soul needs time:

> The soul is at certain moments imperfect and later it becomes perfect, because it suffers the forgetfulness of the divine according to certain circumstances and at a different moment it reactivates the reminiscence; therefore it is clear that time contributes to its path of perfection. How would it be able to change from ignorance to wisdom, and in general from vice to virtue, without realizing a change in time? Every change, indeed takes place in time. (Proclus, *In Alc*. 228.1) (My transl. based on Segonds)

Music is the science of rhythm and time; accordingly, we can expect to find musical connotations in Neoplatonic theories of time in relation to education and the proper *kairos* of its stages. The Neoplatonists related the doctrine of the astral origin of the soul and its descent through the spheres of the planets[537] to the

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[535] Iamblichus (*V.P*: ch.15.64-65, especially p.37, 2-17) depicts Pythagoras' hearing of the harmony of the spheres as due to an inspiration of the genius.

[536] This level of the "undescended" soul (or soul's intellect), which is unaffected in its perfection should not be confused with human individuality (Plotinus, *Enn*. II.3.9.30-1, distinguishes between the compound and the self (*ho autos*); the endowed self and the ideal self). For this reason, although Plotinus made that distinction, Iamblichus and Proclus wanted to emphasise even more, in opposition to Plotinus, the necessity of conversion, recollection and the recovery of the essential nature for the individual soul, which has truly and entirely fallen into the sensible world. On the other hand, Proclus' doctrine of the "flower" of the soul points to a relation between transcendence and immanence that tones down his critique of Plotinus. Cf. Sorabji (2004), p. 93, for the relevant texts in Plotinus and Proclus.

[537] See Aristides Quintilianus on the musical implication of this theory, and Festugière (1954b). Aristides gives the account of the descent at *De Mus*. II.17, 86.20-88.1. Since the soul acquires different properties when it passes through different regions in its descent, Aristides says (II.18-19) that each aspect of the soul's constitution is affected by an analogous musical instrument, according to the resemblance between the region of the universe, the constitution of the soul and the constitution of the instrument: e.g.string instruments (fitted with sinews) resemble the region of the universe and the part of the soul wich are made of ether (dry and simple); wind instruments resemble the region of the universe and the part of the soul that are made of breath (moist and changeable). Another musical implication of this theory presented by Aristides, is that the soul has

process in time that is necessary for the soul to be purified in its return upwards[538], according to an education or "accommodation" (*oikeiôsis*) in life that was traditionally understood as following seven stages or ages, corresponding to the harmony of the planets (Proclus *In Alc*.195-196).

As John Dillon has commented:

> If there are seven planets, after all, it stands to (Neoplatonic) reason that this is because there is a seven-ness inherent in the next highest realm of reality, of which the lower is an *eikôn* (cf. *Theol. Plat*.V 4, p.20.15-21).[539]

The hebdomadic character of the return of the soul in Neoplatonism can be referred back to the hebdomadic character of the Intelligible in the Platonic Theology that Iamblichus, Syrianus and Proclus considered as being the source of practical philosophy as well, and that has manifestations even in fields as close to our common life as the order of time.

This hebdomadic character of the ascent of the soul can be related to Chaldean or Pythagorean sources. In addition, we have also a Platonic text that presents clearly the ascent of the soul towards the Intelligible through seven steps and this is the *Symposium* (211 c - d) and the famous scale of the ascent towards Beauty. Plato depicts there the soul as climbing the steps of a ladder (*epanabathmoîs/epanienai*) that is composed of:

1) a body
2) two bodies.
3) all beautiful bodies.
4) beautiful actions (customs = *epitêdeumata*).
5) beautiful subjects of study (*kala mathêmata*).
6) a holistic science of beauty (*to mathêma teleutêsai*).
7) the very essence of beauty (immediate vision or contemplation of it) in which truth and beauty are identified.

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been fastened to the body by means of ratios and proportions. The constitution of the body, which is adapted for receiving the soul, contains elements which are comparable to an oyster's shell, sinews and spider's webs. In a similar way, the different sinews or strings of the lyre are attuned according to harmonic ratios (Hermes' lyre was made of a tortoise-shell and sinews), and Hermes' name, as god of eloquence (*logios*), is connected with ratios (*logoi*) and proportions (*analogiai*), etc., by Aristides.

[538] Time and change are considered opportunities for ontological purification in Neoplatonism, cf. Proclus, *In Alc*. 228.1.

[539] Dillon, "The role of the Demiurge" in Segonds and Steel (2000), p.344, where he is depicting the intellectual (noeric) order according to Proclus, that is divided into an hebdomad. Dillon mentions also Emperor Julian's *Hymns* where Helios-Mithras, the Demiurge, is presented as hebdomadic (seven-rayed), "by way of anticipation of his physical manifestation, the Sun, who rules the seven planets". We have already seen the ruling significance of the Sun in the scale of the Harmony of the Spheres and also the symbolic character of Apollo's Lyre of seven strings.

We have seen that for Proclus also the sciences or science in general are not the last step but only a preparation for a non-discursive contact with the principles. The example of the *Symposium* shows that in this context it was natural for the Neoplatonists to relate a Platonic education of the soul and ascent to the Intelligible with the Chaldean/Pythagorean ascent through the spheres, both having a *hebdomadic* arrangement.

Philosophers like Posidonius showed an interest in the arithmological connotations of the seven days of the week and Dio Cassius explained the order of the days of the week maintaining that it is based on a musical arrangement.[540]

The correspondences between seven ages, seven days, seven planets, seven musical notes, etc. allow a qualification of time, which helps the soul imitate in its return or ascent, the stages that it has already travelled in a metaphysical and analogical way (the journey is not taken literally as happening in time and space after this life, because the soul is already *returning* in its present life to its source, and this is what makes it what it is).

Life for Neoplatonism has meaning as long as it reflects intelligible life; in this conception a mere quantitative division of time, living one day after the other without qualification is not enough to be a support for a meaningful life; on the contrary living in a microcosmic arrangement of time (with lunar weeks made of solar days, arranged in a musical harmony of the planets, conforming to four seasons marked by the path of the Sun in the Zodiac, etc.) makes the time of life an imitation of Eternity (which is the life of *Nous* with its archetypal qualities in the Realm of Ideas).[541]

In this imitative process the nature of the soul is rendered akin to the stages that it is achieving gradually. In accordance with this analogical frame, the stages that the soul passes through can be identified with stair steps, planets, musical notes, gods, sciences (that compose the curriculum of studies), metals, etc.

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[540] Cf. Posidonius, fr.291 in Theon of Smyrna p.103.16-104.1. See note 152, in p. 65 above. Beethoven expressed the ascent of the soul in the Apollonian Adagio of the *Ninth Symphony* with a music that has an ethereal and contemplative character and that comprises a set of musical variations that can be divided according to seven levels, this is not just a coincidence.

[541] We are not implying that the social organization of time in a calendar of weeks, etc. and that the seven day week are Neopythagorean or Neoplatonic phenomena or directly designed by these schools, but it is relevant that the use of the seven day week become extensive in the Hellenistic world, with Hebrew, Chaldean, Mithraic, Pythagorean, etc. influences; because in this context the number 7 had not only Hebrew and Chaldean connotations but also was related to Greek religion, with Apollo and Athena. Cf. Delatte (1915), p.185, who quotes Macrobius, *de Somm.Scip*. I.6. 58 as an example of this mentality. Cf. also Delatte (1915), p.157 ff. and p. 222 quoting Proclus, *In Timaeum* II. 94.31. See also Odom's study (2005) on the calendar.

Proclus is explaining in his commentary on Plato's *First Alcibiades* why education is related to the god Hermes and presents a correspondence between planets and periods in the human life:

> On the other hand, this is also consonant (*symphônon*) with the arrangement of the Universe (*taxis tou pantos*). The first age, is in fact related to the seleniac activity (Selene, the Moon), because at that age we live according to our vegetative and nutritive faculties; the second, to the hermaic (Hermes or Mercury) activity, because certainly children devote their time to grammar, the cithara and wrestling; the third corresponds to the aphrodisiac activity (Aphrodite or Venus), as they start to put in movement the generating faculties of their nature; the fourth, to the heliac activity (Helios, the Sun), because the young man is placed in his midday (*akme*) and shows the perfection of his age, that corresponds exactly with the midpoint of life between birth and death, for this is the place of midday; the fifth is related to martial activity (*areikes*, Ares or Mars), since men tend to fight and excel; the sixth, to jovial activity (*Diias*, from Zeus or Jupiter), because men consider it preferable to dedicate to public (political) and practical life, with wisdom (*phronesin*); the seventh corresponds to cronian activity (Cronos and Saturn), because at this age is possible to set out from generation and naturally leave it in direction to another kind of life, the incorporeal life. (*In Alc*. 195 – 196) (My transl. based on Segonds) [542]

Proclus introduces the correspondences using the word "*symphônon*" that could merely mean agreement or accord without musical connotations, but if we put this conception in its wider context we cannot fail to notice that in the same way that there is a musical scale of the planets (corresponding to the seven days of the week), there is also a scale of the ages of human life.[543]

Proclus is depicting in the section of the commentary on the *First Alcibiades* that starts in 193.25 the "Hermaic" education that corresponds to the age of youth that opens the way to self-knowledge, which is the topic of the dialogue, together with the consideration of the idea that human beings are their inner soul. Consequently, to know our soul, mainly understood as a mirror of the divine Intellect, is to know ourselves. This is studied specially in connection with the Platonic metaphor —presented in this dialogue—, of the reflection of ourselves in the eye of another person (for our external being) and in the eye of God (or divine Intellect) in the case of the soul. Education is shown as an awakening of this inner vision and the purification of the eye, or mirror, which has the image of God.

The already mentioned metaphors of covering, falling asleep, oblivion, quenching a fire, and their counterparts, cleansing of the vision, awakening,

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[542] Notice that Proclus follows here the "chaldean" order of the planets with the Sun in the middle or "midday" of the Ages; in the same manner, the Sun occupies the middle of the musical scale of the Harmony of the Spheres: *to meson* = note *mesê* or "middle". Cf. note 269, on p. 118 above.

[543] This was most likely a Pythagorean doctrine; nevertheless it is not our task at the moment to demonstrate the origin of this conception. Cf. Proclus, *In Remp*. II. 191.5 where he attributes the theory of the seven ages of life to the Pythagoreans. Festugière's note *ad.loc*. refers to F.Boll, *Die Lebensalter*, *Neue Jahrb*, XXXI (1913), 89-146 = Kleine Schriften (1950), 156-224. Proclus is talking in this passage about the measurement of time in relation to the lunar *hebdomad* and the solar *tetrad*.

anamnêsis and rekindling the fire, together with self-knowledge are explained in the context of the need for a guide or teacher.[544] Socrates plays this role in relation to Alcibiades, and his function is analogical to that of the good genius and also to that of Hermes (as guide of the souls) and the disciplines that he presides over, especially in youth.

Proclus recapitulates the main features of Platonic education, as depicted in *Republic* III and indicates how "grammar, lyre and wrestling" (as mentioned by Plato in the *Alcibiades*) together with gymnastics, music and the sciences (*mathêmata*) play an important part in pursuing political virtue and are the foundation of education in not distorted (*adiastrophê*) political constitutions.

Proclus compares the soul with a lyre and says that the soul has to be tuned (*harmosthai*) thanks to the tension and relaxation of education (*In Alc*. 194.15 ff.). Education is a kind of accord or harmony of the faculties or parts of the soul and since childhood provides with gymnastics the proper tension to the *epithumêtikon* (the desiderative part) and with music, relaxation and tranquillity to the *thymos* (the irascible part). Proclus explains that "the *thymos* is the tone (or tension: *tonos*) of the soul", following the ancient Pythagorean and Heraclitean tradition (also continued in Plato and Stoicism).[545] In this context the soul is structured like a lyre with opposite tensions, and the tension is what establishes its essence and makes it oriented towards a *telos*, a purpose which is as well its source. The soul is then oriented to its happiness/*telos* as if it were suspended in tension from the principle that originates it.[546]

Education is then what keeps the soul's tension in its just measure and prepared for harmony. In this way it directs the soul to its realization. Once the soul is tuned up it is ready to receive harmony.[547] Plotinus gives the example of harmony

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[544] Cf. Eliade (1963), ch.VII "Mythologies of Memory and Forgetting".

[545] Cf. Gill (2006), pp. 31-3 and 286. The centre of this tension in the human soul is the *hêgemonikon*, cf. *ibid*. pp. 33-34.

[546] Aristotle (*Met*.XII, 1072 b 13-14): "On this Principle the heaven and nature depend" (*ek toiautês ara archês êrtêtai ho ouranos kai hê physis*). The verb *artaô* means to depend on and also to be hung upon, and it conveys the shade of meaning of the tension between the cause and the effect.

[547] We do not mean this literally, as if tuning up and receiving harmony occurred at different times: we mean that one can metaphorically think that the process of tuning requires modifying tensions, which "receive" the mathematical and ideal proportions when properly tuned. Vibration in this sense, is metaphorically compared with the "reception" of the positive and forming influence of the Platonic Forms, which "vibrate" in a sympathetic way and are the origin of harmony and other qualities. A musical instrument and the notes that can be made with it vibrate in the correct way when everything is well tuned; in this sense it is adapted for receiving harmonies (in the sense of scales) and the corresponding melodies, which in a sense are ideal (they are arrangements of sound

when he is depicting the relation between the faculties of the soul in *Enn*. III, VI, 4, 41 ff.:

> The nature of an Ideal-form is to be, of itself, an activity; it operates by its mere presence: it is as if Harmony itself plucked the strings. The affective phase of the Soul or Mind will be the operative cause of all affection; it originates the movement either under the stimulus of some sense-presentment or independently- and it is a question to be examined whether the judgement leading to the movement operates from above or not- but the affective phase itself remains unmoved like Harmony dictating music. The causes originating the movement may be likened to the musician; what is moved is like the strings of his instrument, and once more, the Harmonic Principle itself is not affected, but only the strings, though, however much the musician desired it, he could not pluck the strings except under dictation from the principle of Harmony. (transl. MacKenna with some modifications).

This metaphor shows that the instrument is quiet and receives the movement from music itself (the cause is the harmonic movement that is ideal although it comes to the sensible world through the agency of the musician). The basic notion implied here for education and music as therapy is also that the soul is basically a principle of movement, but if it wants to be like and imitate the Intellect (the aim of education), then it needs to receive the ideal harmonic movements from the Intellect. The problem that education faces is that the soul has its own movements, and these movements are troubled or at least different from the intelligible ones, coming from the movements of the sensible world that make it forget the spiritual motions.

The fact that the soul has to be receptive and calm, not being affected by the external movement or *aisthêsis*, is expressed with the image of the calm surface of the sea or a lake, etc. Cf. Plato's *Timaeus* 70d ff and the image of the liver as a receptive and mirror-like faculty.[548] In this way the soul is able to receive its principle and also the comparison shows the "impassive" way in which that principle acts upon the soul as an activity that is present and acts in a manner that is even more than activity, and a calm full of a potency (*dynamis*) that is the productive source of activity (*energeia*).

The importance of music as therapy for the soul is that it can act as a "homoeopathic" cure for the soul's disturbed motions, affections and fears (*pathê*, etc.). Plato depicts this in *Laws* VII, 790d, when dealing with the topic of the

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with qualities that respond to qualities in the Intelligible world and its beauty). The following text by Plotinus illustrates this conception.

[548] Here Plato uses the word "*hêsuchia*" for calm or peaceful state, but in other texts, like *Laws* 791a, the word used is "*galênê*", which is proper for depicting the calm sea. See Sheppard (2003), an article about the metaphor of the liver and the mirror in *Timaeus* 70e ff. On the peace needed for the reception of the Intelligible, like having the soul in a sea port (*hormizein*) see Proclus *In Alc*. 44.17 and note *ad loc*. in Segonds' French edition of this commentary. For the image of reaching the peace of the port see Van den Berg (2000).

treatment suited for the souls of young children, in relation to nursing and rocking them. Plato presents there the example of rocking babies and how when nursing new-born infants, they need to be in movement all the time like in the sea. Of course this is the movement of a calm sea (*galênê*) otherwise it does not work. Plato gives also the example of Corybantism (a frenzy proper to Bacchus' worship). For both cases, crying babies and sufferers of Corybantism, the cure consists in the movements of dance and the melodies of music.

For this reason, says Plato, mothers sing to their babies and rock them. In 790e, we can see that music (and melody) is considered a remedy against the *pathê* of the soul, and it is a form of producing calm that is not to give quietness (*hêsuchian*) but motion (rocking) and not silence, but music (crooning). There are other levels of the soul's relation to the Intelligible and in those stages, as we have mentioned, quietness and silence (*hêsuchia*) have the significance of transcendence, but here Plato is dealing with the relation between the soul's movements in relation to the sensible world's affections (*pathê*) and how other more proportionate affections can produce a sympathy (*sympatheia*) with the Intelligible and spread it over the whole being of the soul. As we mentioned, Plato compares this to "casting a spell" upon the sufferers of Bacchic frenzy. Music is then a form of antidote or therapy (this is proper to Apollo and Hermes) and a spell. External motion, since it participates in a way in rhythm and harmony, reflects in a way the proper inner harmony, which has been troubled in the soul.

As Plato says (791 a), the external motion (both corporeal and melodic) overpowers the internal motions of passions and fears of the soul, and

> brings about a manifest calm in the soul and a cessation of the grievous palpitations of the heart […] The children it puts to sleep; the Bacchants, who are awake, it brings into a sound state of mind instead of a frenzied condition, by means of dancing and playing, with the help of whatsoever gods [791b] they chance to be worshipping with sacrifice. (transl. Bury, R.G.)

This shows that in education (and in musical therapy), it is not a matter of stopping the movements of the soul in a rigid or strict way; that would not be the proper way of Platonic education. It is rather a relation between the external and inner life of the soul, and in this sense it is a matter of entering into the soul as movement (and music and dance can achieve this), and once inside the soul, assimilating the movement that is already there and calming down its passions. The calm is achieved not by leaving the soul empty and quiet with bitterness (this is what happens when the liver is disturbed and not calm, says Plato, *Timaeus* 71a

ff.), but with the sweetness of music, swapping one movement with the other. This is what happens when the disturbed movement is directed to rhythm and melody, as in Plato's example, both with the help of corporeal motion (dance) and the ideal melodic movement of music. This is one way of achieving an imitation of the Intelligible through a recovering of the rhythmical and proportionate movements of the soul. Malleability and not rigidity are needed for this kind of therapy.

The relation between external movements and inner movements of the soul is connected to the relation between faculties or parts of the soul (and the relation between soul and body). We can mention here in particular the relation between *aisthêsis* and *synaisthêsis*, which are important terms in Neoplatonism since Plotinus.[549] We can understand Plato's example, as a question of *aisthêsis* —perception of melody and dance—, that produces an inner *synaisthêsis*, which brings back the soul to its original and calm nature, and these movements are more akin to the Intellect, or at least receptive to it. This *synaisthêsis* is what is inscribed metaphorically in the soul, its original memory, which in the *Timaeus* is essentially a harmony, source of external *aisthêsis*, in its own right, but concealed when sense perception overcomes the soul's nature.[550]

For the moment we can refer back to the parts of the soul mentioned by Plotinus in the text quoted above (*Enn*. III, VI, 4). There is something in the soul that transcends the *phytikon* (vegetative part), the *epithymêtikon* and the *pathêtikon* and is related to the receptivity of the intelligible principles. Faculties such as Memory and an inner *synaisthêsis* transcend the external *aisthêsis* that affects the movement of the life of the soul. According to the gradual development of these faculties, education follows steps, like a scale and in correspondence to the planets and gods (cf. Proclus's *In Alc*. 195-196 quoted above, where moon = *phytikon*), and prepares the soul for the recognition and awareness of its true nature and self-knowledge. The gift of memory and harmony is needed to be ready and receptive for the ideal movements of intelligible harmony, and musical education is what guides the soul in this way. Proclus mentions (*In Alc*. 281 ff.) the doctrine of *anamnêsis* and states that the more important preliminary task for the soul, in order to realize that it already has the

[549] For the context of this psychological theory see the chapter on self-awareness in Sorabji (2004), pp. 134 ff.
[550] On *synaisthêsis* and other terms that express self-awareness and self-knowledge with reference to the more unified faculty of the soul cf. F. M. Schroeder (1987), pp. 677-99.

truth inside, is to purify its own eye from oblivion, and for achieving this the soul needs the awakening assistance of something that puts it back on the track of the intelligible. This hint can come from the exterior and once that is perceived by the soul, it can stir up the soul with analogies or even questions and in that way confronts it again with its own inner part (that has been forgotten and concealed). This stimulator of the soul (*diegeirontos*) is in another sense the teacher (Socrates asking questions, etc.) and also the Hermaic genius.

The teacher, as Proclus mentions several times in the *Commentary on the First Alcibiades* (40.16; 45.9 and 282.3) in relation to Socrates, pursues the same task as the "genius". The idea of listening to the voice of the genius inwardly is very important, giving a significant function to music and hearing in education.[551] Although hearing in general is part of sense-perception this kind of hearing is understood in relation to *synaisthêsis* rather than *aisthêsis*, because music is a kind of intelligible *aisthêsis*, which enters our soul through the ears but it is not directed or intended to be grasped only *with* the ears. The inner character of the voice of the genius appears in Proclus, who mentions that geniuses (*daimones*) guide the soul from within and not externally and comments that they do this "in the manner of leading *from the stern* (*prumna* or *prumnê*)".[552]

As Proclus says, referring to the *Timaeus*, in *In Alc*. 46.5 ff., the genius (*daimonion*) is the same as Intellect, meaning Intellect of a human soul.[553] And this role is played first by Socrates, as teacher and guide (he has this function in act and inspires it to Alcibiades, helping him in the passage from potency to act); and also this faculty is cosmically represented in Hermes. For this reason Proclus (and Plato) use the language of awakening and kindling, in the sense of one passing the flame and lighting up the soul of the other (that was asleep). The sciences and teachings involved in this process (that include music) are *Hermaic* and anagogic in this sense.

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[551] Cf. Burkert (1972), pp. 178 ff., for the importance of silence and many years of listening in Pythagorean education. On the importance of silence for hearing the voice of the genius see Proclus, *In Alc*. 44.15 ff. Cf. Trouillard (1973), about *synaisthêsis* and spiritual hearing.

[552] See Liddell-Scott note: "ships were generally drawn up on land by the stern"; and also the metaphorical use of this word: "*prumna poleôs*" = Acropolis, which is another term used by Platonism to refer to the Intellect present in the soul. There was also a lantern or an ornament in the stern. And it was the place of the pilot.

[553] Cf. Proclus, *In Remp*. II. 334.15. Cf. also II. 271.6 for a more detailed account of *daimon* in Proclus. Cf. Cornford, *Plato's Cosmology*, p. 354 for a commentary on *daimon* in the *Timaeus*.

Hermes plays the role of guide of souls as is well known,[554] and Proclus presents this doctrine in *In Alc.* 195,10 ff.:

> [Hermes] presides over the whole education, one can see why he is the guide (*hêgemon*), who conducts us into the Intelligible and elevates (*anagein*) our soul out of the mortal place, who guards the various herds of souls and dissipates their sleep and their loss of memory, he who is the giver of *anamnêsis*, whose aim is the pure intellection of divine beings.

The unity of the soul's faculties is only achieved when it is directed towards the Intelligible. The part of the soul that the Stoics called *hêgemonikon*, following among other sources Plato's image of the charioteer in the *Phaedrus*, has to be identified with Hermes in the context of Proclus' *Alcibiades Commentary*.[555] In the same way that this god collects and herds the souls, the central part of our soul (its *synaisthêsis* and in a more proper sense, the *Logos* and the Intellect) must collect all the faculties in a pure activity that imitates the pure activity of the divine Intellect, activity that was expressed by Plato with the metaphor of "playing" because when one plays one follows a process of imitation and operates in a simple and intuitive way, with the whole being. For this reason, in many languages playing music is described with verbs that refer to the playing of children.

Another interesting metaphor in this context is that of the marionette, which is not irrelevant to our topic, because its basic performance is due to the work of strings that pull together.[556] As we have seen, "tension" as unification and harmony was related by Proclus to the soul, musical education and the lyre, this together with the metaphor of the World-Soul and the Universe as ordered in a single musical string (or *aurea catena Homeri*),[557] already studied in previous chapters.

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[554] Cf. Segonds note *ad loc*. (*In Alc*. 195.10, p. 400 Vol.II). Cf. also Plato, *Phaedo*, 108 a – c, about the need of guides for the soul.

[555] Cf. Calcidius, *Timaeus*, (CCXX) 256. 19, about how the "*principale*" of the soul is located in the heart and from there unifies sense perception. Calcidius quotes Chrysippus and his metaphor of the spider in the web that perceives everything thanks to the vibrations of the threads, an image that is related to that of the Lyre and the strings (the hand that plays is compared to a spider); cf. Marius Schneider (1998), who studies the musical connotations of the solar spider, which is a frequent symbol in mythology. Cf. also Aristides Quintilianus, II. 17, 88 on the comparison between the soul structure and the spider's web, especially in relation to Hermes as god of *Logoi* in the sense of proportions and bonds. Cf. Gill (2006), pp. 33-34, on the metaphor of the spider in Stoicism.

[556] See page 90 ff. above.

[557] Homer, *Iliad* VIII, 18 ff., image that appears in Plato's *Theaetetus* 153 c, in the context that education and learning for the soul is "motion" and identified with the Sun in the cosmic level. Cf. P. Lévêque (1959), Buffière (1956) and Lamberton (1989), p.272.

In Book I, 644 a ff. Plato defines "education" as one of the greatest gifts to man.[558] At 644 d he presents his illustration of the puppet, which again is based on strings and motions, an aspect that we need to take into account not only because of the musical instrument as a metaphor of the soul, but also because music itself puts in motion the strings of the soul. Here, Plato explains that the strings are like the affections of the soul and that there is a thread made of gold, which is the one that gives unification, simplicity and also shows malleability (a quality needed to receive the intelligible principles in soul's life in the material world), in contrast to the threads made of iron. This thread is the "sacred and golden string of reason (*logos*)", which is also the common law of the city (*Laws*, 645a).[559]

The notions of movement and imitation are related to the metaphor of the mirror, which represents the quality of the receptivity of the soul that allows the principles to act in their simplicity and pure operation (like the puppet that allows the puppeteer to move it, or the mirror image that follows the original image). In the case of music, as Plotinus says (*Enn*. III, VI, 4; see p. 247 above), the instrument is tuned and ready to follow an unheard ideal melody that acts upon the strings, by itself, according to the principle of Harmony. The image of the mirror appears in the *Alcibiades* (133a) in the metaphor of the pupil of the eye, and how we are reflected in the more bright part that has the faculty of vision as a little *kore* or doll.

What makes possible the connection between the eyes, or the mirror, in these metaphors, is the ray of light. The same thread of unity, depicted as the golden string of the puppet corresponds to the concentrating faculty of the Intellect and self-knowledge. This concentration is gained through time that is one of the main conditions of the soul's level, which appears when the soul looks outside itself and proceeds in a Neoplatonic sense.

Time is like a thread that unifies different moments, and this unification can only be achieved when time acquires qualification and this is achieved as rhythm.[560] Time imitates a pattern following a natural analogy, like the order of

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[558] These "gifts" are the result of a divine providence that corresponds to the activity of gods and geniuses, who assist human souls. In an analogous way, guardians, herdsmen and pilots assist the living beings allocated to them (*Laws* X.906a-907a).

[559] *Logos* as common law of the city recalls Heraclitus (DKB114) here. See p. 90 above.

[560] Cf. St. Augustine's definition of time in *Confessions* XI, especially ch. 23, where time is conceived as a kind of extension. Extension is always related to qualified division and proportion in Neoplatonism.

the week that corresponds to the planets and the ages of man according to each faculty of the soul.

The centre of the musical scale as we have seen is the note *mesê* that corresponds to the Sun. In this sense both Hermes and the Muses are directed towards a circulation around the Sun. In the metaphor of the puppet and its main conducting string, we find again an association with the symbol of the Sun, because the string is made of gold.

The metaphor of return is linked to the image of "connection" and tension to the aim; it contains also aspects of imitation, assimilation, reception and orientation. The return of the soul then, can be seen as an ascent or also as unification, because when a string of unity can connect all the discursive steps, the soul is placed, even from a "distance", in the unifying *tonos* of Intellect. Hermes and the good genius (and also the teacher) perform this function of bridge, together with the gifts of education, since youth.

We have seen how the main aim of education is to elevate the soul to the Intelligible (*In Alc.* 195,10) and the anagogic role of Hermes as guardian, depicted by Proclus as "*ephoros*". Music, both in the stage of education for children and in the following stage of the guardians (and philosophers), which study the sciences, belongs to the Hermetic disciplines. The inspired music of the Muses is a stage above that kind of music and Apollo crowns the whole series, with the highest kind of music.

We have seen the different levels of music according to Proclus and how inspiration (intellectual intuition) is higher than rational science. In this sense, the different steps of education are a preparation to higher levels of Intellection, and this is implied in the Neoplatonic anthropological context that claims that man is more than a "rational animal", as the character of Philosophy reminds Boethius (*Consolatio*. I. Pr.6). Music plays a very important role in showing that reason and science are not the more important parts of education. There is a level of music that is science (anagogic or sacred science) but depends and leads up (*anagein*) to a higher level that can only be grasped through inspiration, and it is more than human.

Another kind of science can lead to the pride of the rational animal. Philosophy explains to Boethius that he needs a remedy, the remedy of self-knowledge, which as we have seen leads to the Divine Intellect, cause and origin of the soul.

Philosophy urges Boethius to consider that he is more than a "rational animal" and at the same time, advises him to accept with humility that the soul is just a puppet of the Intellect. This remedy or antidote includes music, as we have seen in Proclus' *Commentary on the First Alcibiades*. On the contrary, if the golden thread is not followed, the soul wanders in the sea of oblivion, and it does not matter how well science can depict in detail the *aisthetic* world, if it does not know anything about the *synaisthetic* and Intelligible worlds. In contrast to this, the more important is the anagogic presence, in the sensible, of something that is not perceptible, and this cannot be experienced in science (or in music as a science) but only in music as sacred art and evocation (as echo) of a higher level, that is opened up in the relation between the inner genius and the illuminating activity of the Muses and Apollo.

Concluding comment

We have seen that the importance of musical education and of music in general for the human level resides in the fact that it prepares the soul gradually (according to different levels or kinds of music) for its ascent to the Intelligible. For the Neoplatonists, music as an inspired art proceeds from the Muses and plays an important role in the return of the soul that starts very early in life because of the privileged nature of this art that can penetrate the human soul. This is possible because the inner part of us and its movements (vibrations) have a harmonic structure that is in natural sympathy with cosmic music. In this way music is able to make a connection between the macrocosm and microcosm (called contemplation, etc.) and when music enters into the soul, it places the soul in its proper position in the cosmos and orientates it to the direction of reception —in peaceful serenity—, of the spiritual influence of the Intelligible. In the ascending reception of this influence the soul follows different stages (because the descent of the inspiration also follows these stages) that can correspond to the planets, or to gods like Hermes, the Muses, Apollo, etc.

We have seen that for Hierocles the aim of philosophy —especially the Pythagorean philosophy that puts emphasis on music—, is the perfection of the soul. Music instills in the soul a longing or nostalgia for the aim, the Intelligible; and the different levels of music correspond to different stages in the method of

perfection that the soul follows, according to different levels of being, which correspond as well to cosmological, gnoseological and ontological levels.

Both myth and music, symbolism and hieratic art are necessary for the conditions of existence of the soul in the sensible and corporeal world. They educate the imagination and reasoning faculties of the soul, because otherwise the longing for the intelligible reality would be so powerful that it would agitate the soul in confusion. This is the reason for gradually following steps in education and the reason why different musical modes, together with kinds of music and kinds of poetry, are appropriated for some audiences and others for others, such as inspired music and poetry proper to a particular age of life, or scientific and educational and therapeutic kinds for other ages.

As we have seen, the basic scheme that organizes music as a reality and as an art-science is triadic, in the sense that it leads the soul from the sensible to the Intelligible, through an intermediary stage that is the realization (or recovery) of an inner harmony in its own level, which makes possible the reception of and connection with the intelligible Harmony (in terms of tuning and musical sympathy). This stage represents the awakening of the *nous* in the soul (*logos*), presided by Hermes. The diagram (9) we have presented above (p. 236) includes a similar triadic scheme, known in its Boethian formulation, which comprises, as we have seen: *musica mundana*, *musica humana* and *musica instrumentalis*, corresponding to *nous*, soul and body. These three components, together with the level which corresponds to the ultimate One, make the four levels of music in Proclus' classification.

The triadic classification that constitutes three of the levels of Proclus can be found in another passage (already quoted in the Introduction, p. 13) of the Neoplatonic philosopher, expressed in a more general sense:

> intelligible harmony is manifested in a three-fold way. First there is 1) Harmony Itself. Then there is 2) that which has been harmonised in the primary manner and is this way throughout the whole of itself. Third, there is 3) that which has been harmonised in a secondary manner and participates in a way in harmony. One must refer the first to Intellect, the second to the Soul, and the third to the Body[of the World]. (*In Timaeum* II. 295. 2)

The soul contains within itself a reflection of all three levels, because of its intermediary nature that mirrors the reality which is above and the reality which is below. For this reason it traverses the whole harmonic reality, as if it were a

musical scale, in its journey of ascent to the Intelligible with the help and guide of Music.

It is worth noticing the influence of these Neoplatonic ideas on audible music that we can listen to at the present time. We think that the true composer considers at the same time all the levels of music presented by Proclus. Beethoven for example, shows an interest in expressing philosophical ideas in music. His *adagi* or slow movements have been influential in the history of music as an expression of the ascent of the soul to higher spheres. The *adagio* of the *Ninth Symphony* is a clear example of this musical ascent, and influenced Wagner's *Lohengrin* Overture, Bruckner's *adagio* from his *Seventh Symphony*, and Mahler's *adagi*. All these *adagi* arrive through a climax to a highest point, sometimes emphasised by the clash of cymbals, which expresses the journey (passage) of the soul to the *hyperouranion topon* or Intelligible world.

Or to take a more recent example, Sir John Tavener is a musician who composes music that is symbolic in the Neoplatonic sense depicted here. For example, his most recent composition *Towards Silence* includes four movements, which correspond to the four states of Atma, that noticeably match Proclus' four levels of music.[561]

The influence of Neoplatonism on Classical and Romantic music is an interesting line of research. Symbolism and myth play an essential role in the music of Beethoven, in particular his *Ninth Symphony*, and in Wagner's operas.[562] It would be interesting to consider these artistic manifestations against the background of the works of F. Creuzer and Schelling, etc., in which the intuitiveness of the symbolic is an attempt to surpass the limits of the discursive

[561] This composition had its premiere at Winchester Cathedral on 6th July 2009.

[562] We had alluded throughout this work to Beethoven's *Ninth* as a musical composition that can illustrate a "Neoplatonic" conception of music. We are aware that we could have mentioned many other examples from the different periods of the history of music from Ancient music, through Monteverdi to Gustav Mahler or even contemporary composers. However, we have chosen this particular symphony by Beethoven because the first movement has been understood traditionally as a musical cosmogony in which the creation of the world is represented with sound. Wagner later followed Beethoven's way of representing "primordial music" in his Prelude to *Rheingold*; see Darcy (1993), p.77, and especially note 26 and Kropfinger (1991), p.229. Cf. Cook (1993), p.30: "the opening of the movement represents silence made audible". We could also add that the second movement is a Dionysiac dance, the slow movement has an Apollonian contemplative character, and the last choral movement portrays the return of the souls, and expresses musically how all share a kinship with one another due to their common origin. The whole symphony ends with the unification or harmonization of the Dionysian and the Apollonian. Schiller/Beethoven said "all men shall be brothers"; Proclus wrote: "Thus all souls indeed, are sisters, according to one demiurgic cause, and according to the vivific principle and fountain from which they proceed." (III.184.24-26, Taylor's translation).

reason of the Enlightenment. In both disciplines, Romantic art and philosophy, there is an influence of ancient symbolism as depicted in Neoplatonism.

We have not space to examine the full extension of the influence of Neoplatonic aesthetics on Romanticism or on Tavener's musical symbolism; however it is important to mention that the relation between music and metaphysics is still pertinent today. Since Tavener's approach is based on a universal exposition of metaphysical doctrines, it is also possible to apply to his works the metaphysical connotations that music has in Proclus, in an even more unambiguous manner than in Romantic compositions. The contemporary access to the composer's programmatic thoughts could help us in a comparative study in the same way that Beethoven's letters, conversation books and other private documents could provide us with interesting insights into the relation between music and philosophy.

General Conclusions

The integration of the themes studied in this thesis into Neoplatonic philosophy, especially into the comprehensive view of Proclus, continued to have an important influence on subsequent thinkers and artists. We examined a wide-ranging selection of texts, in order to show the richness of the Proclean *Commentaries*, which following the tradition of Iamblichus at the end of Antiquity, tried to combine previous reflections on music in what can be called a metaphysics of music. Since we could not cover all the ramifications of our topic, we focused on the principal aspects of this doctrine, investigating ideas about the harmony of the Soul, cosmic harmony, the symbolism of the musical scale, and especially the relation between music as exegetical language and the metaphysical reality that music evokes for Proclus.

We examined the Pythagorean and Platonic background of the Neoplatonic doctrines and after this we presented Proclus' interpretations of the *Timaeus* and the *Republic* following the "procession" of music from *Musica Mundana* to *Musica Humana*. Although it can be said that also the *Republic* is a source for the study of cosmic music, from the point of view of our study, the levels of reality expressed in this dialogue were interpreted according to the return of the soul that traverses them (in the section concerning human music). Furthermore, cosmic music appears in this dialogue in relation to its mirroring in the ideal society and in the grades of the education needed to prepare the citizen of the ideal *polis*.

At the end of our last chapter we mentioned the importance of further research on the influence of the Neoplatonic conception of music on the tradition of Western Classical music, especially in Romanticism and in the contemporary composer Sir John Tavener. This would show the relevance and validity of this point of view in our contemporary world. A metaphysics of music, such as Proclus', which is able to inspire music with meaning according to a conception of hieratic art even in our superficial, materialistic and relativist culture, proves to be valid and perennial, as Tavener characterizes it.[563] The importance of this conception of music resides in the fact that music appears as "pontifical": maker of a bridge between Earth and the transcendent reality of the Intelligible world.

[563] See Tavener (2005).

We have seen that this "pontifical" aspect of music for Proclus can only derive from an inspired incantation or invocation, typical of Orphic-Pythagorean music.

The possibility of a music based on this conception could show that the Pythagorean/Neoplatonic tradition is capable of being revived. Until the time of Ficino, philosophers sympathetic with Platonism considered that there had been an uninterrupted tradition from Pythagoras through the Middle Ages to the Renaissance. Nowadays, to establish that this tradition was passed down uninterruptedly would require persistent research and accumulation of textual evidence. On the other hand, a composer or a musician, who practises an art that is impossible to transmit without the personal master-pupil connection, would more willingly accept the existence of an interpretative tradition (including music's references to extra-musical meanings). At the same time, we are aware of the difficulty in confidently assigning philosophical meanings to musical compositions. A possible solution to this problem can be worked out by considering the composers' testimonies and writings about their art and how the audiences received their compositions. This comparative study is of special advantage in understanding philosophical concepts of music with the help of illustrations taken from audible compositions.

Neoplatonic *Musica Instrumentalis* could be exemplified by instrumental compositions of audible music from the Classical and Romantic periods; however, another option for illustrating Neoplatonic music could be to chose vocal and choral music from the Middle Ages and the Renaissance, thus concentrating on *Musica Humana*: the direct expression of the voice of the soul, closer to *Musica Mundana* which is analogous to intelligible music, as a reflection of it.[564]

Tavener's attempt to revive a tradition of sacred music and choral music based on the different religious traditions is also an example of *Musica Humana*, as a central aspect that unifies the triple manifestation of music, drawing closer together the other two Boethian categories.[565] Furthermore, Beethoven's *Ninth* (*Choral Symphony*) could be studied as another example of the unification of these levels.

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[564] Cf. Crevel, M. van (1964). This author studies the relation between Neoplatonism and polyphonic music, especially as symbolized in the *Missa Maria Zart* by Jacobus Obrecht. Cf. also the works by Godwin and Haar in the Bibliography.

[565] However, as we have seen, in the Neoplatonic system of correspondences an instrument can also symbolize the soul or even the metaphysical principles.

Worth considering also would be the impact of this conception of music on other traditions, especially on Islamic Philosophy. In Sufism in particular one can find the doctrine that sacred art and especially music are a mode of prayer that joins all levels of Reality. For Proclus too everything corresponds to (or *is*) a mode of praying, a prayer to the following levels or higher degrees than the level at which one is at present; accordingly, through the mediation of the intermediary levels everything exists as a hymn to the One. Because the One is in the end the only Reality that is worshipped through his manifestations in every form and degree of being.[566] This can be seen in Proclus' *De Sacrificio* (*On the Hieratic Art*)[567] and the image of the heliotrope and its prayer, which has been studied by Corbin in relation to Sufism and Ibn 'Arabi.[568] The example of the heliotrope in Proclus' *De Sacrificio* depicts how the vibration of the petals of the flower makes music or hymns while the flower rotates following the Sun. The same cosmic sympathy connects the rotating planets singing and dancing around the Sun and the prayer of the whirling Sufis. The fact that this text of Proclus was translated into Latin by Ficino confirms the presence of the same tradition in the Renaissance. At the end of the Middle Ages, Dante too presented the doctrine of the ascent of the soul through the spheres and the famous levels of the Universe of the *Divina Commedia* are full of music.

All these ramifications of the theory of music studied in our thesis are worth investigating in further projects. It is my hope that this thesis has made some contribution to show the significance of music for philosophers and of philosophy to musicians.

[566] Cf. Ibn 'Arabi, *The Bezels of Wisdom*: Aaron, p. 246 in Austin's translation (1980).
[567] The Greek text has been edited by Bidez (1928).
[568] Cf. Corbin (1998) p. 105 ff.

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