

The Metaphysical Meaning of the Musical Scale of Plato's *Timaeus* in Proclus

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The principal aim of this article is to investigate Proclus' interpretation of the musical scale presented by Plato in *Timaeus* 35b4 ff., in the context of his philosophical views on music. The Neoplatonic exegesis can be better understood against the background of the Platonic-Pythagorean conception of *mousikê* inherited by the Neoplatonists, which 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, functioning as a principle of unity and cohesion. At the same time, for Proclus, and other Neoplatonists such as Iamblichus and Syrianus, the harmony of the soul (*harmonia* understood in its technical meaning of "musical scale"), is an expression of the creative power of "divine numbers". The numbers of the *Timaeus* have a significance that goes beyond their mathematical meaning; mathematics is employed analogically to express an intrinsic kinship between metaphysical principles and their effects of beauty and order in reality.¹ Accordingly, a musical scale made of harmonious numbers (ratios = *logoi*) makes possible the symbolic contemplation (*symbolikê theoria*) of the paradigms in their effects or images (Proclus, *In Timaeum* II.246.4-9 and *In Rempublicam* I.198.18).

The use of mathematics and mythology as analogical ways of expressing metaphysical principles reflects Proclus' methodology of combining Pythagorean and Orphic (or Chaldean, Homeric, etc.) languages to depict reality as an interconnected whole, where the unifying principle is manifested as an all-pervasive intellectual (noeric) energy or life that produces continuity in the multiplicity of physical reality and connects it back to the simplicity of the Intelligible. For example, Proclus calls this energy intellectual "fire" (*Hymn* I.1; *In Tim.* II 43.30), or Apollonian light and "harmony" (*Theol. Plat.* VI.12 p.68,7-10; cf. p.61, 7 and 15 and VI.17 p.83,9-12) and makes a correspondence between the

¹ On the analogical value of mathematics in Neoplatonism see D. O'Meara, *Pythagoras Revived: Mathematics and Philosophy in Late Antiquity* (Oxford 1989) 81-84 and S. Slaveva-Griffin, "Number in the Metaphysical Landscape" in P. Remes and S. Slaveva-Griffin (eds.), *The Routledge Handbook of Neoplatonism* (Routledge 2014) 200-215. Cf. Proclus, *In Crat.* 6.2: "By 'Number', he [Pythagoras] hinted at the intelligible order encompassing the multitude of intellectual Forms (transl. Duvick)."

Sun and the World-Soul, which is coordinated to the divine Intellect. Proclus calls the World-Soul “*coryphaeus*” (chorus leader, cf. *In Remp.* II.238.20-21) because it is the focal point of the cosmic accord of the Sirens.² In Plato’s account of cosmic harmony in the *Republic* (617c - d) each Siren sings one of the eight musical notes of the octave, and these notes depend on an Apollonian paradigm. The Pythagorean connection between Apollo, cosmic harmony and the Sirens can be found in Iamblichus’ *Vita Pyth.* XVIII, 82,12-13):

- What is the Oracle of Delphi?
- The *Tetraktys*; that is, the harmony in which the Sirens sing.

The Oracle reveals the source of metaphysical and cosmological truth (based on an unseen principle), which is manifested (*ekphainein*) as light but also as the harmony of the *tetraktys*, which is behind the whole arrangement of the Universe (see p. 89 below; the ratios of the basic intervals are contained in the *tetraktys*). The “splendid” voices of the Muses are comparable to the light that raises the soul to Intellect, for Proclus (*Hymn to the Muses*), who also connects Apollo, the Sun, the light of truth and the power of harmonization, illumination and unification with the Intellect in *In Crat.* 98.1-4 (cf. 78.24-25;90.17;101.9-10; 90.17).

Music is made of tones (gr. *tonoi*, from the verb *teinō* = stretch) and these tones epitomize the stretching energy that connects upwards to unity (in the Neoplatonic hierarchy) and downwards, to the realm of multiplicity, connecting all things. The Muses represent a more intellectual unification than that of the Sirens, because they are harmonized to the musical activity of Apollo Musegetes, who, on the one hand celebrates Zeus “with intellectual songs and on the other hand, maintains together (*synechei*) the world in its entirety with indissoluble bonds, moving together all things” (Proclus, *In Remp.* I.57.8 – 23; cf. *In Crat.*102.12; 103.3.15). These bonds appear in the *Timaeus* of Plato (35a-39e) as the musical proportions that constitute the World-Soul (proportion in general is also depicted as “bond”; cf. *Tim.* 31c4 and *In Tim.* II.15.13-30).

Historians of science often wonder why the Pythagoreans and Platonists did not embrace a purely scientific language, opting instead for reintroducing mythology in their cosmology. For Proclus, the Pythagorean mathematical language of the *Timaeus* is needed as a bridge in order to transcend external ap-

² Proclus (*In Tim.* I.202.15 ff.) mentions that Timaeus is called “best at astronomy” in the manner of the *coryphaeus* of Plato’s *Theaetetus* (173c7), because he “pursues astronomy beyond the heavens”, studying the invisible (metaphysical) causes of the ordering of the planets and stars “as one who imitates the universal Demiurge, in whom the heaven and all the stars are present intellectually, as the theologian says”. Proclus identifies the theologian poets with Orphism, and here he refers to *Orph. fr.* 168.10-16 (cf. *In Tim.* I.161.21-26). In this Orphic context, Zeus is the *coryphaeus* holding the beginning, the end and the middle of all things that exist. Cf. also Aelius Aristides, *Oratio* VIII.53.11, where it is said that Sarapis is the *coryphaeus* of the universe, and holds the beginnings and the ends.

pearances and reach the realm of essential reality. When he connects numbers and musical notes with divine principles, he is not doing this because he has an intellectual handicap and makes scientific progress difficult by reverting back to mythological views instead of using a fully abstract/mathematical language. Rather than being an intellectual ballast, for Proclus, mythology (or Orphic theological language) provides us with a way of expressing the connective life of the universe both as mathematical harmony and as “divine music”, without making the universe a mere mechanical, lifeless, process.

1. The metaphysical causes of music and harmony

Different numbers and musical notes or intervals can portray distinctive characters (*idiotêtes*), which according to Proclus’ conception of causality have their origin in the divine peculiarities of each Henad or God.³ Proclus tries to explain the origin of the universe in terms of the procession of the manifold from the One or First Principle, and the Henads (divine unities) provide a bridge between the absolute One and the “unitary manifold” of Being (*El. Theol.* 138) in a way which is similar to the Pythagorean derivation of reality from number. The Henads can be understood as aspects of the One, and thus, they are beyond being (*El. Theol.* 115; cf. 123).⁴ In Proclus, the relation between Plotinus’ second hypostasis (Intellect: *noûs*) and the One is mediated by the henadic realm, which explains the causes of the three stages of the Intelligible, the Intelligible-Intellectual and the Intellectual. This produces a triadic structure of three intelligible triads, in which the first aspect is “existential” (*hyparxis*), the second is a power (*dynamis* of procession and mediation), and the third is the determinate product of activity (*energeia*). As Gersh points out, these triadic aspects are manifested all through reality as three stages, including: monad, dyad and triad; remaining, procession and reversion; being, life and intellect, etc.⁵

Proclus explains in *In Timaeum* II.125.10 ff, how the structure of the section of the *Commentary* dedicated to the origin and composition of the Soul (*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 spiritual being, there are the three aspects already mentioned: essence (*ousia*), potency (*dynamis*) and activity (*energeia*). The essence of the soul in turn has a triple nature: it contains substance (*hyparxis*), harmony (*har-*

³ Cf. E.P. Butler, “The Intelligible Gods in the Platonic Theology of Proclus”, *Methexis* 21 (2008) 131-143, especially 137.

⁴ Cf. E.P. Butler, “The Gods and Being in Proclus”, *Dionysius* 26: 93-113 (2008)

⁵ S. Gersh, “Proclus as Theologian” in S. Gersh (ed.), *Interpreting Proclus: From antiquity to the Renaissance* (Cambridge 2014) 87-88 and 100-104.

monia) and form (*eidōs* understood as *schēma*).⁶ 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).⁷ The mediation of the soul, especially connected to the notion of “harmony” as the second term in the triad of its own *ousia*, can be coordinated with the notions of life and power, and especially with the second Intelligible triad, which is the paradigm of all mediation and connective life, by being in the middle between the first and the third triads.

The first Intelligible triad corresponds to the first manifestation, in the procession of multiplicity from the One, in terms of the duality of principles known as the Limit (*peras*) and the Unlimited (*apeiron*), and the combination of these two principles produces primal Being as the mixed (*mikton*, in the language of Plato’s *Philebus* 16c-e), which in turn communicates limitation and infinity to all beings. If we conceive this combination as harmony (in terms of Philolaus, *Fr.6*), we can observe that harmony is present both as a transcendent principle (a hidden/causal harmony) that produces Being (in the first intelligible triad) and simultaneously as coordinated within the mixed product (especially manifested in the second and third intelligible triad). This aspect of coordination is more appropriately “musical”, because the structural divisions of the universe have their origin in the Second Intelligible Triad, where the henadic power of the dyad is manifested as the origin of discrete numbers (*Theol. Plat.* IV.29.87-88; cf. *El. Theol.* 113). At the same time, the continuity (*sunecheia*) that encompasses all things depends on the cohesive/connecting and mediating power of the same Second Triad, manifested as the “space” or “continuum” where the manifold of the Gods is contained, and identified as the origin of the “supracelestial place or heaven” (the highest element in the intellectual realm, cf. *In Parm.* 1128, 34-35).⁸ Arithmetics would correspond to the study of discrete number, and music (*Harmonics*) to the study of the relationships between numbers (dyadic relationships, ratios, numerical-musical powers *i.e.* *dynameis*, middle terms or means,

⁶ In this context, form or figure are understood as the principle of outward form of the ontic product of activity, while Proclus sometimes characterises form as *ousiōdēs* (according to essence), as a higher kind of form, which can be applied to musical harmony as providing noeric circulation and cohesion; or in connection with the form of the soul as a continuum, the category of space and the geometrical nature of the soul (both linear and circular). This is related also to the Aristotelian definition of soul as form (*eidōs*), 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 P. Merlan pointed out in *From Platonism to Neoplatonism* (The Hague 1968) 42-43.

⁷ Cf. Plato *Timaeus* 35a ff.; see also F.M. Cornford, *Plato’s Cosmology: The “Timaeus” of Plato translated with a running commentary* (London 1937) 59 ff. and Proclus, *In Timaeum* II. 139.32 ff. and 155.1 ff.

⁸ See E.P. Butler, “The Second Intelligible Triad and the Intelligible-Intellective Gods”, *Methexis* 23 (2010) 137-157 (especially 140-141).

etc. cf. *In Tim.* II.21.18-22-20). For the Pythagoreans, the derivation of number and the mediation of music produced the whole cosmos, 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)

There are echoes of this Pythagorean conception in Plato's account of the origin of the order of the heavenly circuits and their dependence on harmonic circles and musical intervals within a World-Soul composed as a musical scale (*Timaeus* 35b-37a). According to the *Timaeus* the universe is a *kosmos* (beautifully arranged whole), as the result of a combination of *harmonia* (a harmonious fitting together/attunement, from the verb *harmottein*) and *taxis* (order and regularity). In the cosmological account of the *Timaeus*, the craftsman or Demiurge is the divine cause that makes the world an ordered and well-arranged (*tetagenon kai kekosmêmenon*)⁹ production. The Demiurge, in order to pass the quality of living orderliness from the model (*Tim.* 29A-30C) he is contemplating to his creation, composes a World-Soul that operates as a mediator between the intelligible model and the sensible production (or physical universe), which is a living copy or image (an animated body) of a living Paradigm. As a source of beauty and life the Demiurge is called "poet and father".¹⁰

The numbers used by the Demiurge in the creation of the harmony of the soul manifest an aspect of ordering but also an aspect of "life". The Tetrad, as Iamblichus says, is "pan-harmonious" or "embracer of all harmony" (Proclus, *In Tim.* II.215.10-11), and simultaneously represents the principle of "intelligible life", manifested in the fourfold "animal" or "living being" (the already mentioned Paradigm of the *Timaeus*).

Since for Proclus, the Paradigm corresponds to the third Intelligible triad, before looking at this in more detail, I propose to return to the topic of the origin of harmony in the Intelligible triads. In Proclus' system, Apollo appears in dif-

⁹ In the *Gorgias* 503e, Plato defines "craftsman" as someone who transmits a certain order and fitting together of the parts to the production, arranging everything according to harmony. Plato uses *harmottein* and the cognate verbs related to *taxis* and *kosmos*, mentioned here in brackets, also used in the *Timaeus* and in the Neoplatonic commentaries. Cf. Proclus, *In Tim.* I.285, 2; where he also uses the verb "*harmozô*" = "fit together", "harmonize".

¹⁰ The Demiurge is called "*poiêtês kai patêr*" by Plato in the *Timaeus* (28c 3, cf. 41a 7; cf. *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).

ferent triads of gods, especially in the triad of hypercosmic gods or the hypercosmic-encosmic gods; and the “intelligible music” proper to this god would correspond to the level of the intelligible-intellectual. It can be said that music (and its foundation in harmonious numbers) is prefigured at the higher levels, according to its unitary cause, in a hidden manner (*kruphiôs*).¹¹ However, the supra-essential mingling (coalescing = *symphyomai*) of *peras* and *apeiron* in the first triad, and secondly, the origin of both number and the connectedness of life in the second triad, cannot be strictly speaking depicted as harmony. Nevertheless, the third triad, which represents the Intelligible Paradigm as Tetrad can be depicted as source of all harmony and music. The first Intelligible triad is “prior to being” and “prior to life”, the second triad is “life itself” or “Intelligible life” and the third triad is a determinate “something with life” (*In Tim.*I.419.19-420.20). Proclus connects the procession of number and the procession of harmony, depending on a principle of Intelligible harmony, in the same way as physical and psychic numbers depend on Intelligible numbers:

For according to the thought of Plato, Harmony Itself (*auto-harmonia*) is neither the soul nor that which is in things that have been harmonised. Rather Harmony Itself is uniform (*monoeidês*), separate and transcendent of such wholes as have been harmonised – this alone is that which is said to be Harmony. But the harmony that is established within things that have been harmonised is a harmony that belongs to these other things and is “in another” and multifiform and naturally such as to be moved by something else. But the soul’s harmony is intermediate between these harmonies, for the soul’s harmony is the first thing that is harmonised. [...] Since the soul’s harmony is set beneath intelligible harmony, it is also subordinate to the intelligible numbers. However, since it is superior to sensible harmony, it is also superior to sensible number. So if it is necessary to say something generally about each of these things, each one of them exists in a fourfold manner. In the case of number, the first is divine, the second is substantial, the third is psychic, while the last is physical. Of these four, the first is uniform (*henoeidês*); while the second is changeless; the third is self-moving; and the final sort of number is such as to be moved by something else. In the case of harmony, the first harmony is in god, the second in the Being that really is, the third is in the soul, and the final case is the harmony that is in the things that have been harmonised by something else. If, therefore, it had been Plato’s intention to discuss the soul’s harmony now, he would have said that it is an intermediate between the indivisible and divisible harmony. But since he instead proposes to discuss the essence of the soul in the text that is before

¹¹ Cf. *In Tim.* II,77.7: *kruphiôs* said about the shape of the universe. In general, what Proclus says about shapes that belong to geometry as having intelligible causes, even above the Intelligible-Intellectual, can be applied to the science of harmonics and music (cf. *In Parm.*1127.28-1129.9; cf. also *In Tim.*II.70.5-14). The circular and straight shapes of the soul (connected to “procession” and “reversion”) have their counterpart in the straight “movement” of musical octaves (represented by 2, 4, 8) and the returning movement of musical fifths (represented by numbers 3, 9, 27); cf. *In Tim.* II.222.29-223.10.

us, he said that it occupies an intermediate [position] with respect to [the gradations of] Being, Sameness and Difference. (*In Tim.* 161.12-162.4, transl. Baltzly).

In this passage Proclus shows that there is a divine Intelligible harmony, even prior to Being, which is divine and uniform (*henoidês*), followed by the substantial (*ousiôdês*) Harmony of Being and, subsequently, by the harmony of the soul (psychic) and that of the physical universe.¹² There is therefore a “musicality” which depends on the Henads, and that should be one of the characteristics shared by all the members of the Apollonian *seira* (cf. Proclus, *In Crat.* Sections 174.1; 174.34 = 96.1; 97.15-99.8 Pasq.), depending on that henadic distinctive peculiarity (*idiotês*) which is the source of the “ontology of music”. I borrow this expression from Butler, who connects it with the “musicality of Apollo, which is founding for musicality as such”.¹³

Proclus mentions the level “intelligible harmony” again at *In Tim.* II.295.2 ff. and in *In Remp.* II.239.10, distinguishes between Apollo’s “noetic” harmony and a “noeric” harmony proper to the intellective circuit of the muses. The Muses (9 in number) lead over all different classes of Sirens. Apollo is the monad of the Muses, accordingly the Decad (9 Muses + Apollo = 1) can contain the model of the harmony of the spheres of the world, which in turn is depicted in the *Republic* as containing 8 Sirens. Thus, the ratio of the interval of tone (9/8) can represent the relationship between noeric (9 Muses) and physical harmony (8 Sirens). The ratio of the tone appears when we consider the interval of four as containing two tones plus a semitone (*leimma*), or as the difference between a fifth (3/2) and a fourth (4/3). These two together compose the interval of octave (2/1).¹⁴

2. The Tetrad and 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).¹⁵ 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 ratios

¹² Plotinus also mentions the Intelligible harmony (*noêtê harmonia*) in the *Enneads* (I.3.1.28; II.9.16.39 and I.6.3.28). This conception has its origin in Nicomachus and Thrasyllus, cf. Theon of Smyrna, *Exp.* 46.20-47.10, where “*aisthêtê harmonia en organois*” is contrasted with “*noêtê en arithmois*”. This numerical and intelligible harmony is also manifested in cosmic music (*en kosmôi*).

¹³ E.P. Butler, “The Third Intelligible Triad and the Intellective Gods”, *Methexis* 25 (2012) 131–50, (see 132).

¹⁴ The basic component of modal scales is the “tetrachord” (a group of four notes). The tetrachords can be “conjunct” or “disjunct”; the tone of disjunction is the interval of fifth from above. See the tetrachords of the scale of the *Timaeus* marked by square brackets in the Diagram in Appendix 1.

¹⁵ Cf. *In Carm. Aur.* XX, 45-8.

of the main musical intervals are thus contained in these numbers: 2/1 (octave); 3/2 (fifth) and 4/3 (fourth).

The unity or monad on top of the diagram symbolizes the uniform character of the Intellect (intuitive and non-discursive), followed by 9 other dots or pebbles. If we consider them as arranged with the monad at the centre, the other nine can be seen as surrounding it.

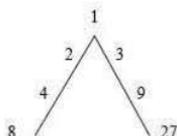


The decad presented in this fourfold form was a symbol in which the key of the Universal Harmony was concealed and constituted a solemn oath for the Pythagoreans:

No, I swear by him who transmitted to my soul the *Tetraktys* in which the fountain and root of the eternal Nature lie.¹⁶

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, expressing in musical terms the source or the potency of life (the zoogonic power of the tetrad).

In the *Timaeus*' reworking of the account of the musical creation of the universe, Plato uses a double *tetraktys* (cf. Theo of Smyrna, *Exp.* 93.25 ff.), comprising two sets of four numbers or progressions that enclose the World-Soul and its musical scale. The musical scale of the *Timaeus* unfolds from the first number or portion (its monad) at the top, through the intervals of four octaves, a fifth and a tone, following two numerical progressions (1-2-4-8 and 1-3-9-27) that reach the numbers 8 and 27 as symbols of solid realities. 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 of double and triple (odd and even, depending on the principles of *peras-apeiron*) is harmonized in the transcendent Unity on top, and it was attributed by Plutarch to Crantor (*De An. Procr.* 1027 d; cf. *In Tim.* II.171.4 and 192.25 where Proclus mentions also Adrastus):



¹⁶ 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. W. Burkert, *Love and Science in Ancient Pythagoreanism* (E. Minar, transl.) (Cambridge, Mass 1972) 72 and 186 ff. and A. Delatte, ch. "La Tetraktys Pythagoricienne" in *Études sur la Littérature Pythagoricienne* (Paris 1915; reprinted in Geneva 1974) 249-268, for the different versions of the oath. Proclus quotes the *Carmen. Aur.* verse 47: "source of ever-flowing nature" about the *tetraktys*.

Another musical expression of the tetradic life in the scale of the *Timaeus* is, according to Proclus', its span of four octaves (plus a fifth and a tone). The procession of harmony follows three steps, from the Monad (*hyparxis, ousia*), through the Tetrad (*dynamis*, life) towards the Decad (*energeia*, perfect product). Proclus, following Syrianus, in his *In Timaeum* I. 432.16 ff. identifies 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.¹⁷ 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.

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 correspondence is appropriate as well: 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, potentially, in the transcendent Monad, which is the first principle of number that contains everything (also the even and odd, principles of number identified with *peras* and *apeiron*) as in a seed, and that proceeds firstly to the coordinated pair of principles: monad and dyad. This analogy implies three levels of harmony:

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, transl. Baltzly).

In the context of the *Timaeus* then, the Demiurge contemplates the Paradigm, the Tetrad, and he also looks to himself (because as demiurgic Intellect he contains in another sense the Paradigm whithin himself, cf. *In Timaeum* I. 431. 30 ff.). In the demiurgic intellection, the Decad takes part in the creation of the World-Soul that will be in turn the source and archetype of order for the physi-

¹⁷ According to Syrianus (*In Met.*106.4-15) quoting a Pythagorean *Hymn to Number*, the Tetrad is the model of all things, the Ideal Living Being, where all the Ideas/Forms are present "intelligibly" and "tetradically" (*noetôs kai tetradikôs*); and they are conained "intellectually" and "decadically" (*noerôs kai dekadikôs*) in the demiurgic intellect. Proclus referring to the same Hymn in his *In Timaeum*, I.316.17, depicts the "procession of divine number" 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. The Tetrad comes from the paternal Monad, and the Decad emanates from the Tetrad. Cf. O'Meara (n.1 above), 136 ff. And Delatte (n. 16 above), 208 ff. 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 Hierocles' views about this doctrine, see I. Hadot, *Studies on the Neoplatonist Hierocles* (M. Chase, transl.) (Philadelphia 2004), 63 ff.

cal world, and the World-Soul itself depends on the paradigmatic numbers that are contained in a concealed way in the Intellect (the Demiurge).

3. The Tetrads and the Intelligible-Living-Being

Proclus calls the Paradigm or Intelligible-Living-being, the “Living-Being-itself” (*Autozôion*), commenting on Plato’s *Timaeus* (30c; 31b2). This Living-Being is for Proclus the first thing that participates in Being and Intelligible life or Eternity, corresponding to the third triad of the Intelligibles (See *In Tim.* II 416.15 and especially II.419.16 ff.).¹⁸

This paradigm is quaternary (tetradic; cf. *Tim.* 39e) and contains the potentiality of all life and subsequently projects everything, as if it were bursting into sound and vibration.¹⁹ According to the Orphic mythological account followed by Proclus (I.427.6 ff.), the paradigm is compared to Phanes, a god with four animal heads issued or manifested (*ekphainein*) from the silence of eternal and transcendent Being, represented with the cosmic Egg, the source of all existence and life in the cosmos. The Orphic Egg is an offspring of the combination of Ether and Chaos, interpreted in a Pythagorean way by Proclus, as the principles of Limit and the Unlimited, in terms of Plato’s *Philebus* 27d (cf. Proclus, *PT*, III.9).

The Pythagorean version of the Orphic myth corresponds to a musical cosmology, because the combination of Limit and Unlimited is the result of the workings of “*harmonia*” (e.g. Philolaus, *Fr.* 6). Thus, the fourfold Living-Being-itself is the paradigm of harmony, identified with the quaternary source for all musical intervals, the “*tetraktys*”, which contains all musical ratios, as we have seen.

In the *Timaeus*, the ‘noeric’ Demiurge (the third term of the first triad of the intellectual gods) looks to a ‘noetic’ Paradigm. There is a series of mirrorlike reflections, where the metaphysical principles beyond being (having the role of a

¹⁸ Cf. Gersh (n.4 above) 102-103.

¹⁹ Another interesting aspect of the Orphic account of Phanes or Protogonos, is that the god awakes (*egeirein*) and issues from the Egg making a sound (this cosmic awakening was expressed in musical compositions with what is known as “Ur-Musik”, according to Busoni’s views on the possibilities of evoking primeval times with music. See J. Habron, “Sonorous Air: The Transcendent in Ferruccio Busoni’s Aesthetics of Music” in Férdia J. Stone-Davis (ed.), *Music and Transcendence*, (London and New York 2015) 37. Proclus, quoting the Orphic myth, compares this primordial sound of the fourfold Living-Being with the “bellows of a bull and the roars of a fierce lion”. This sound is connected to the instrument called “bull-roarer” or “rhombos”, dedicated to the goddess Hecate, who is usually depicted by Proclus (quoting the *Chaldaean Oracles*, fr.32) as a source of life connected to the Living-Being-itself (cf. *In Tim.* I.420.12 ff.) and the mother of the gods (Proclus, *Hymn*, 6.1; 6.13). Michael Psellus in his commentary on the *Oracles*, fig. 206 (PG. CXXII. 1133a5). mentions a wheel of Hecate that makes a drone, a whirring sound (*rhoizos*), which Psellus connects to the *Iynges*, the divine birds and also theurgic instruments, which also represent the Platonic Forms issuing with a burst of sound from the Paternal Intellect.

monad) appear reflected in the Tetrad of the Intelligible level, and secondly at the intellectual level of the Demiurge and his creation of a World-Soul, which is also tetradic and the model of the harmony of the world. Because of the analogous character of Neoplatonic metaphysics and cosmology, the Demiurge is Decad in relation to the Paradigm (and the Paradigm is Tetrad in relation to the Monad of Being), but the Demiurge is Monad for the Soul, which is Tetrad now, while the cosmos or physical universe is Decad, as a perfect creation.

The Intelligible harmony contained in the Tetrad (or *tetraktys*) is closely connected with the notion of Intelligible life and its continuous "procession", and also with the idea of cosmic sympathy and friendship, which has its source in the harmony of the Soul (cf. Plotinus, *Enn.* IV.4.41.1 and IV.4.8.56, and Proclus, *In Tim.* I.18.1-2; *In Remp.* I.288,6-289-6).

The Pythagorean Ocellus Lucanus, fr.1 (Stobaeus, *Eclog. Phys.*I.16) expressed the following view about the interaction of life and harmony:

As life contains (*synechei*) the bodies of animals, whose cause is the soul, so harmony, connectedly, comprehends the world, whose cause is God. Likewise concord unites families and cities, whose cause is the law.

Music and harmony can convey the connection with essential life, primordial present in the Intelligible world and diffused through the universe thanks to the Demiurge, conceived as "father" and identified with Zeus, son of Rhea the "mother of the gods".

It is the harmonious structure made according to the art of the demiurge, who is a "poet" or "creator", that guarantess the flux of life from the Paradigm, and since the Demiurge transmits this life to the Soul, he is a "father".²⁰ Proclus connected life with proportion (*In Timaeum* II. 24.5 ff.) and since life is the cohesive activity of Soul and Intellect, proportion in general was related to the "geometrical" proportion (*analogia*) which is the basic one that was known as "continuous", showing the continuity of the universe and the sympathy between all its parts.

The sound proffered by Phanes (symbolized with the inarticulate voice of an animal or the voice of an element such as fire or wind), represents the Paradigm as a source of pre-cosmic vibration (previous to a manifestation of the musical ratios), which has the all-potentiality to become all sounds (as the whole string, the length of a tube and also a drone can represent the unitary and continuous musical and vibratory space where – or in relation to – the notes of the scale can be differentiated). The tetrad is the "potency" of the "decad" and corresponds to cosmic life and cosmic sympathy. Accordingly, the space opened by the four octaves represents the potentiality for the other divisions, the fifths and fourths (and tones and semitones), in a more derterminante level.

²⁰ See n. 10 above.

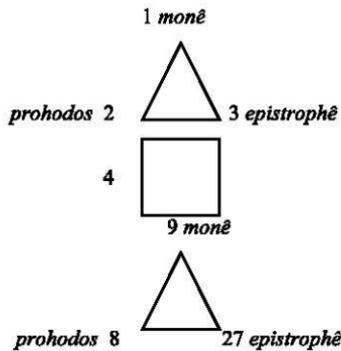
Proclus mentions the unity in multiplicity of the cosmos and compares it with the unification of partial sounds in a common sound:

So this cosmos too is a composite living thing, emitting different sounds from different parts of itself and a single [sound] from all of its parts [together]; for it also is a manifold 'one' (*In Tim.* I. 429.19-21, transl. Runia and Share).²¹

3. The triadic structure of harmony and the mediation of the Soul

Dillon, in his edition, translation and commentary of the Fragments of Iamblichus' *Commentary on the Timaeus*, presents a very helpful diagram in order to explain Iamblichus' views on the seven numbers of the *Timaeus*.²²

I propose a simplified version of this diagram here:



All the numbers are contained in the Soul, as Dillon points out, but the mediating tetrad represents properly the Soul (as pan-harmonious *tetraktys*) between the Intelligible (*prôtos diakosmos*) and the sensible (*deuteros diakosmos*) mentioned by Iamblichus (see Proclus, *In Tim.* II.132.10 for the contrast between the Intelligible world and the secondary manifestation). This is the passage where Proclus refers to Iamblichus (*Fr.* 53 Dillon):

The divine Iamblichus celebrates these numbers with all his power as things with the causal efficacy to bring about certain wonderful properties. He denominates the

²¹ Cf. II.305.7-21, where Proclus says that the World-Soul antecedently comprehends (*prolambanein*) all sensible things, and for that reason the universe is one living thing and sympathetic with itself, "so that all the things that have come to be are parts of the life of the world as if it were a single drama." Although there are different speeches and the voices of all the players, they are all contained in the voice of the poet. The World-Soul, "like a many-headed creature, speaking through all its heads (some in Greek, some in barbarian tongues), encompasses the causes of all the things that come to be, knowing the particulars by means of universals, the accidents by means of essences, and the parts by means of wholes, all things in a simple manner thanks to the divinity within it".

²² J. Dillon, *Iamblichus Chalcidensis, In Platonis Dialogos Commentariorum Fragmenta* (ed., transl., and comm.) (Leiden 1973) 332, Iamblichus, *Fr.* 53.

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 [$3 \times 3 = 9$] 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 [$2 \times 2 \times 2$], and 27 corresponds to the triad for a similar reason [$3 \times 3 \times 3$]. 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 correspondences 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 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, transl. Baltzly)

The first triad (or triangle in the diagram) represents Being as the first principle of manifestation, with the Demiurgic Monad on top (and permanence, *monê*), which in terms of harmony corresponds to Apollo, and it is the source of unity for the soul represented with the tetrad and the sensible universe (the lower triangle). Number (2) and (3) represent power, life and procession, and *energeia*, intellect and reversion respectively.

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.

The first portion (1) or term appears in its musical representation as the first note of the descending scale of the *Timaeus*, source of the subsequent octaves and fifths/fourths. The dyad (2) is provider of procession and differentiation. Procession corresponds to overflowing and unlimited intelligible Life, which produces everything as from a full source, generating the musical octaves (the double progression); this shows that procession is made through similar and dissimilar things, 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.

Music expresses the containing/cohesive aspect of return in relation to number (3), acting as limit, in the interval of fifth (cf. Proclus, *In Timaeum*. II.222.29). The 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 the passage from E to A; the A is already a new defined note, not an octave of the same note).²³ Consequently, the fifths "return" and this makes them capable of symbolizing the metaphysical conversion to Intelligible being and towards the first term or monad, which represents the One as the Principle of Unity for everything. The ratio of the fifth is composed of 3 and 2 ($3/2$), and if we add or multiply these two numbers the result, i.e. 5 or 6, corresponds to cyclic numbers; five is an image of the circle of the Intellect, six an image of the circle of the Soul (*In Tim.* II.233.17-20).

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 an encompassing harmony and concentration into the *hestia* (the modal centre, or key-note, of the scale in which one is playing) of *Nous* represented in the first Monad, and not get lost in dispersion.

The tetrad (4) is the complete harmony (pan-harmonious) because it contains all the musical intervals: the *tetraktys* as the sum of $1 + 2 + 3 + 4$. As we have seen, 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 is

²³ For us, according to modern music theory, another aspect of the triple progression/reversion of fifths would be that the fifths are ordered in a cycle called the "circle of fifths", which was also a theory known by the Ancient Chinese theorists. See Burkert (n.14 above), 471, who compares Pythagorean harmonics with Ancient Chinese musical cosmology, where similar correlations were made between $3/2$, $4/3$, male-female and Yin-Yang, quoting Granet, *La Pensée Chinoise* (Paris 1934), 230 ff. On the relation between Pythagoreanism and Chinese philosophy and music see also J. Needham, *Science and Civilization in China*, Vol.2 Section 13.d.4 "Pythagorean numerology" and Vol.4 (Section 26.h on Acoustics with K. Robinson; W.Ling, collaborator) (Cambridge 1956 and 1962) and L. Laloy, *La Musique Chinoise* (Paris 1903) 39 and 45. Sometimes the "Pythagorean method" of the generation of the scale or the "method of concordance" used for tuning the lyre are connected to this theory, cf. Barker, *Greek Musical Writings II: Harmonic and Acoustic Theory* (Cambridge 1989) 33 note 22; 49. The ascending fifth and the descending fourth are also mentioned as sources of definition for the periodicity in the arrangement of the cycles of the days of the week and the seasons, etc (see Dio Cassius's *Roman History*, XXXVII.18-19; Plutarch, *De An. Procr.* 1028 E-F and Aristides Quintilianus, *De Musica*, III, 19, p.119, 15-18 W.-I.).

the beginning of a secondary cosmic order (*deuteros diakosmos*), which would correspond to the following triangle, where number 9 acts as monad. The ennead (9) is provider of real completion and sameness. It is the result of perfect and similar parts: 3×3 . It participates in the nature of the Same and it is like a “new one” (after the etymology: “*hen neon*”),²⁴ because it has an analogous place to the first monad, having the position of *monê* or permanence in this last triad (9; 8; 27).

The ogdoad (8) has a position analogous to the dyad, because it belongs to the double progression, as cube of 2 ($2 \times 2 \times 2$). 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).²⁵

The *eikosiheptad* (27) is provider of conversion for the last beings, because is the last term of the triple progression and a cube ($3 \times 3 \times 3$). It plays a role similar to the ogdoad (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.²⁶ Number 27 corresponds to the last note of the *Timaeus* scale understood as a diatonic scale in descending Dorian mode. If we start from an “e”, this note is a “g”, which as we shall see below, corresponds in different cosmic scales to the note of the Earth.

The three levels of Iamblichus’ diagram can be summarized as $3 + 4 + 3$ (two triangles and a mediating tetrad) = 10 (the perfect Decad). It is interesting to note that if the monad of the first triangle corresponds to Apollo, the nine as

²⁴ Cf. Proclus, *In Remp.* II 4.20 ff. and Hermeias in *Phdr.* 90.27 quoted by Dillon (n. 22 above) 235.

²⁵ 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.

²⁶ 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 E.R. Dodds’ commentary in 236 ff. of *The Elements of Theology* (ed. and transl.) (2nd edn., Oxford 1963), 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”.

“new one” corresponds to the Muses, which act as the noeric monad for the sensible harmony of the Sirens (represented with number 8, as mentioned before).

If we add up $1+9+8$ we get 18. The symbolism of $18/16$ as double of the ratio $9/8$ symbolizes a more secondary level in the procession, and can be related to an account that Proclus gives of the spheres of the world in *In Remp.* II. 238, 23, distinguishing celestial Sirens (a monad followed by a hebdomad = $1 + 7$) 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 ($2 + 14 =$ terrestrial Sirens). The Muses produce an “intellectual harmony (*noera harmonia*)”, while the Sirens produce a bodily concord (*harmonia somatoeidês*). If we add all these numbers, taking into account also Apollo as the highest monad, we have 34 terms:

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

This number (34) is the total of notes contained in the *Timaeus* scale according to an interpretation mentioned by Proclus:

All the musical scales involved in the generation of the soul involve 34 terms, or else 36 terms through the inclusion of the *apotome* [Timaeus of Locri] [...] if the number of terms in the soul is 34, it nonetheless turns out that this number too is fitting to the soul – if indeed the unit is Intellect (as it is indivisible), but the cosmos is the number 10, then the soul is 4. For this reason, all number proceeds ‘from the undefiled depths of the monad’ – up to the sacred tetrad, which has given birth to the mother of all, ... the undeviating one, the unwearying one; they call her pure decad.

The tetrad has sides that form a dyad, and when we take the square twice and add the [dyad] of sides, we get the aforementioned number [$2 \times 4^2 + 2 = 34$], while the number 34 is an imitation of the soul when it pluralises itself from itself together with the appropriate generative power. But if the soul is composed from the second *epogdoos*, i.e. from the 16 and the 18, then here too the number 34 would result since the tone is also particularly appropriate to the soul. This second *epogdoos*, since it forms the *paramesos* between the intervals that are in tune and those that are not, is appropriate to the intermediate [nature] of the soul, and generally characterises the diatonic genus in terms of which the whole soul has been harmonised. (*In Tim.* II.233.9-234.4, transl. Baltzly)

Both the relationship between 9 and 8 (according to the ratio of the tone, the *epogdoos* = $9/8$) understood as we have seen as representing the relationship between the Muses and the Sirens of the *Republic*, or as Proclus says here, considering the relationship between $18/16$ (the second *epogdoos*), are significant for understanding the amount of musical notes in the scale, and especially why is this connected with the Soul as mediating and harmonizing power in the cosmos. As Proclus says, the relationship between 18 and 16 represents the tone in the middle of the whole system of the scale of the *Timaeus*, note 18 being the “*paramesê*” and 16 the “*mesê*”.

The *paramesê* 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.²⁷

We have the testimony of Ptolemy that shows not only the identification *paramesê* = Sun in *Harmonics* III.16 (111),²⁸ but what is more remarkable is that in the Canopus inscription ascribed also to Ptolemy,²⁹ 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 = 16.³⁰ 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.

For Proclus, the harmony of the soul, being intermediary, reflects the triadic division of the universe into intelligible, sensible and the middle position of the soul itself. Accordingly, Proclus classifies harmony in a triadic manner:

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

²⁷ In Theon and Proclus the Sun represents the Heart of the World (Cf. Theon of Smyrna, *Expositio* Ch 33, 187.13-188.5 Hiller; Proclus, *Hymn to Helios*, 5 ff and Macrobius, *In Somnium Scipionis*, I, XX, 6. Cf. also and Julian, *Oratio* IV, "To the King Helios", 134b). Accordingly, the "heart" symbolizes appropriately the presence of the Noûs in the middle of the Soul (the Noûs has a supra-rational and non-discursive quality represented with 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 exactly the *mesê*: showing with 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* (36b) when he says that the Demiurge bends the Soul in the middle; since this word is used in the context of 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.

²⁸ Cf. Barker (n. 23 above) 390-391 and 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).

²⁹ Cf. Barker *ibid.*, 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>.

³⁰ The correspondence between Mercury and 16 can show also the usual association between number 4 and Hermes (born in the fourth day cf. *Homeric Hymn* 4, 19), as in the case of the Lyre of four strings (Nicomachus, *apud* Boethius, *Inst. mus.* I.20), 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.

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. 295. 3-7, transl. Baltzly with some changes).

The harmony of the soul mirrors the intelligible harmony and it is at the same time the closest cause and paradigm of the order of the world. Proclus is applying a general metaphysical principle stated by him 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)

Therefore, all levels of reality must be reflected in the musical scale of the *Timaeus*, which can be understood as a symbolic ladder that leads from the sensible harmonies to the intelligible harmonies and the One (cf. Proclus, *In Timaeum*, I, 58,27 ff.).

4. The musical scale of the *Timaeus* as containing the Intelligible, the intermediary Soul and the harmony of the physical universe

The three levels of harmony reappear in this text already quoted partially, which follows the Pythagorean formula of development or derivation “Monad-Tetrad-Decad”:

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, and is a single intellectual proportion (*logos noeros*) that has been filled up with all of these ratios. Moreover it is consistent (*symphōnon*) 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, transl. Baltzly)

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 which is in its parts".³¹ 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 Musegetes] 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, transl. Baltzly)³²

Proclus says (In *Timaeum* II.170.2) that the Scale is composed of four octaves + one fifth + one tone.³³ If we add the ratios of these intervals (remembering that addition regarding intervals is multiplication), we can see that they add up to 27:

$$2^4 \times 3/2 \times 9/8 = 27$$

He also mentions (II.188.25 ff.) that the scale is in the diatonic genus (and that Plato does not mention the *apotomê* used by Timaeus of Locri), and consequently 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 (comprising 24 tones and 9 *leimmata*, cf. II.187, 13). Proclus also takes into account that Porphyry considered the scale to be a plurality numbered and harmonized according to the diatonic genus (In *Timaeum* II.214.25 – 30).³⁴

This division and harmonization of the portions is done according to divine paradigms:

[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 simultaneously encompasses within himself the causes of both of these gods, he also divides

³¹ We have mentioned the returning and enclosing power of the interval of fifth. 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). Also, in the *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).

³² 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.

³³ Cf. also *In Timaeum* II.187.15; 207, 21 and 234, 7.

³⁴ The scale of the *Timaeus* proposed by Proclus is also in the diatonic genus. Cf. A.E. Taylor, *A Commentary on Plato's Timaeus* (Oxford 1928), 143. Proclus follows Plato's *Laches* 188d and gives especial importance to the Dorian mode (*In Remp.* I.57.8), therefore the *Timaeus* can be interpreted as proposing a descending diatonic scale in the Dorian mode.

the soul into parts and harmonises it, for the number that is common to both of these is the Hebdomad, since the theologians 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, transl. Baltzly)

The double-octave (1-2-4), contains ratios composed by numbers that add up to seven (first octave = 2/1 and the second octave = 4/2). It can be said also that there are seven notes in two tetrachords taken together corresponding to a seven-stringed lyre dedicated to Apollo.³⁵ 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.³⁶

The importance of the double-octave can be appreciated if we consider the first two octaves of the scale of the *Timaeus*, taken in descending order from number 1 to number 4 (or between numbers 384 and 1536, used by Proclus and Timaeus of Locri),³⁷ as the paradigmatic *tetraktys* (see Diagram in Appendix 1).

³⁵ Nicomachus' planetary scale in *Ench.* ch. 3 contains two conjunct tetrachords in the diatonic genus, see Barker's diagram in (see n.23 above) 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, 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 (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.

³⁶ 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.

³⁷ This number 384 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", J.Haar *Musica Mundana, Variations on a Pythagorean Theme*, PhD dissertation (Harvard University 1960), 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, cf. Proclus, *In Timaeum* II. 171.4). Cf. Also Haar, *ibid.* p. 21. Severus preferred 768 as base number and he finished his scale with a *leimma*, (*In Timaeum* II.191.1 ff.). Proclus says he is using the same numbers than Timaeus of Locri (*In Tim.* II.188.9): "But since Timaeus the Pythagorean (96b) says that there are 36 terms in the scale and he takes as endpoints the same numbers as Plato - 384 and 10368 - then in order that there should be no inconsistency, let's see how the remaining two terms have been inserted". Timaeus of Locri, 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 flats (B ♭), instead of 4096 and 8192 (and leaves out 2187); total addition = 105,947, see *In Tim.* II.236.9; cf. II.170.31. For Proclus, 384, being the product of 6 multiplied by 64, is suitable for the *Timaeus* scale, because six a symbol of the Soul (*In Tim.* II.233.12). 64 is in the ratio of 9/8 (tone) with 72, which is another meaningful cyclic number. As J. Dillon points out, 64 is the cu-

If we take into account Proclus' suggestion that number 34 (the total amount of notes/terms of the scale), can be divided into 18 and 16 terms; then the first 18 terms will take us until note 2048 (*paramesê* = musical note "b"; or 2187 if the b is flat); and the next 16 terms will start in note 2304 or number 6 = 2304/384), which is the arithmetic mean between 3 and 6 (or between 1152 and 3456). This number 6 or 2304 would mark the *mesê* of the whole scale of the *Timaeus*. The double octave (1536/384) which is above the World-Soul —itself properly reprinted in the region of the interval of tone between *mesê* and *paramesê* (2304/2048)—, would then symbolise the Intelligible harmony of the *tetraktys* (1-2-3-4; taking into account that 384 corresponds to 1 and 1536 to 4 in the original set of numbers of the *Timaeus*).

The scale is composed of four octaves, one fifth and one tone, but we are not told the order in which the intervals should appear. According to the proposed interpretation, the paradigmatic double octave, could be followed (in descending order) by an intermediary interval of fifth (2304/1536), as being placed between two sets of double-octaves (near the *paramesê/mesê* symbolizing the World-Soul). Thus, we will have another double octave (from 2304 to 9216, or between 6 and 24), which portrays the model of the harmony of the physical universe, the harmony of the spheres (usually represented in the Middle-Ages and the Renaissance with the scale that comprises the *systema teleion* or Perfect System of 15 notes plus one extra tone = A (the note called *proslambanomenos* corresponding to the sphere of the Moon).³⁸ The last extra tone (27/24 or 10368/9216) symbolises the Earth, and was usually represented with a letter G or *gamma* "T", the origin of the word "gamut" (scale) in English (*gamma* + *ut*; *ut* = C). This note, for example, corresponds to Thalia in the scale of the Muses in Ramos de Pareja (Ramis of Pareia).³⁹

Therefore, the logic of the scale is manifested if we divide the 4 octaves: 4 x 2/1) in two octaves on one side of the fifth, and another two on the other side (each double octave would be represented with the ratio 4/1)⁴⁰:

$$4 \times 3/2 \times 4 \times 9/8 = 27$$

We have, in this way, two double octaves joined by a fifth as mediating interval plus a tone. Our interpretation of the scale, centred around an intermediate

be of the first square (4^3) and the square of the first cube (8^2); see *The Heirs of Plato: A Study of the Old Academy, 347-274 BC* (Oxford 2003) 24.

³⁸ Cf the depiction of this system in Ptolemy, *Harmonics*, 2.4.1 ff. (50.10), especially the diagram in Barker's translation in (n. 23 above), 327. For the note of the Moon = A, see Aristides Quintilianus *De Musica*, III, 21 [120, 30 and 123.2] and for a different interpretation of the *proslambanomenos* as the Earth note see Plutarch, *de procur. an. in tim.* 1028 F 6 – 1029 A 4.

³⁹ See the diagram in J.Haar, *The Science and Art of Renaissance Music*, (ed. by P. Corneilson) (Princeton 1998) 83. 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 $\Gamma = Terra = 10368$ (the last number of the *Timaeus* progression) and Zarlino's Diagram, in the Appendix 2 below, with $\Gamma = 10368$.

⁴⁰ The ratio of the octave is 2/1, then two octaves is = 4/1 (2x2), four octaves = 16/1 (2x2x2), etc.

interval of a fifth (and the *mesê* at 2304) has the advantage of showing how the structure of the scale can portray Proclus' or other Neoplatonists' metaphysical 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:⁴¹

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 = 6+8+9+12+1; cf. Nicomachus of Gerasa, *Harm.ench.*7.10 and *Excerpt.*7.19, p. 279 Jan):

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 27.⁴² 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.

⁴¹ 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 *soffeggio*: Do, Re, Mi, Fa, Sol, La, Si.

⁴² In the previous paragraphs I have been using the original numbers of the *Timaeus*; they correspond to 384; 768; 1152; 1536; 3072; 3456 and 10368.

As Iamblichus says, 27 is a cubic number (a solid number), which in a planetary scale of the Harmony of the Spheres could correspond to the Earth.⁴³

In conclusion, the last two lower octaves + one tone in the scale of the *Timaieus* 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 *Timaieus* scale represents the sensible world and its principle of unification in the Soul.⁴⁴ The number 18 on the other hand is the double of 9 and is related to the Muses, the principles of the intellectual 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 the circular return and mediation of the Soul, in the transition from the octaves between 384 - 1536 ($e''' - e''$) to the octaves between 2304 - 9216 ($a - A$). The fifth marks in this way the passage from the Intelligible to the sensible.

The paradigmatic relation between the world, the World-Soul and numbers is such that what is seen in numbers and their musical properties is also seen in the structure of the world. The diffusion of monad, dyad, triad, tetrad, pentad, decad, etc., through all levels of existence expresses not only the continuity of the structure and its harmony, but also the applicability of mathematical and musical concepts for expressing the metaphysical characteristics proper to the Henadic level. The vertical and descending structure of the musical scale of the *Timaieus* as a whole represents for Proclus, not only those levels of reality and their ontological peculiarities, but also an ontological subordination of these levels, expressed according to musical intervals joined together in a "systema" of notes (and as levels in the different octaves of the scale). The divisions of the scale into double octaves, fifth and tone, portrays a causal derivation going from higher to lower notes, symbolizing the descent from an Apollonian Monad, which corresponds analogically to the ultimate One, down to the material world and its audible harmony. A detailed working of the musical derivation of reality is not always presented explicitly, but it is clear that the *tetraktys* —understood as an intermediate *dynamis* between, on the one hand, true Being and the permanence of the Monad, and on the other hand, the *energeia* of the Decad—, rep-

⁴³ For a more detailed study of Proclus' interpretation of the scale of the *Timaieus* see S.F. Moro Tornese, *Philosophy of Music in the Neoplatonic Tradition: Theories of Music and Harmony in Proclus' Commentaries on Plato's "Timaieus" and "Republic"*, doctoral thesis (Royal Holloway, University of London 2010).

⁴⁴ Cf. *In Timaeum* II.234.1 ff. and II. 208.9; 210.24; 234.22.

resents the source of the harmonious flow of numbers and notes from the primordial Unity. Accordingly, the harmony of the World-Soul represented in the scale can be studied in the context of Proclus' Neoplatonic views, as a sonorous support for a symbolic contemplation of metaphysical principles. The dynamic musical mirror (*musica speculativa or speculum musicae*) of the World-Soul displays the interaction between the Paradigm of the *Timaeus* —understood as encompassing the unitary manifold of true Being within its intelligible life— and the intellective creativity of the Demiurge. Harmony is thus the expression of the connectedness of all life.

Appendix 1

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

* Not included in Proclus, they are doubles of 2048. T = tone (9/8); L = *leimma* (256/243). AM = Arithmetic Mean; HM = Harmonic Mean. This diagram shows the double progression on the left side and the triple progression on the right side with all the terms mentioned by Proclus.

Appendix 2

INTRODUKTORIO tino ordinato fe- Pithagoric Diatro-		1536	cc					la	tuono
		1718	dd					la	fol
		1947	cc					fol	fa
		2048							mi
		2187	bb					fa	fi. ma.
	Nete hyperbol.	2304	aa				la	mi	re
	Parante hyp.	2592	ff				fol	re	ut
	Trite hypbol.	2916	ff					fa	ut
	Nete diexaug.	3272	e				la	mi	tuono
	Parante die.	3456	d				la	fol	re
	Trite diexau.	3888	c				fol	fa	ut
	Para met.	4096							mi
	Tuono.	4174	b					fa	fi. ma.
	Mef.	4508	a				la	mi	re
	Lycha. mef.	5184	G				fol	re	ut
	Parhyp. mef.	58.	F				fa	ut	tuono.
	Hypate mef.	6444	a				la	mi	fi. mi.
	Lycha. hyp.	6912	D				fol	re	tuono.
	Parhy. hypa.	7776	C				fa	ut	tuono.
	Hypate hypat.	8192							mi
	Protilibanomen.	9116	A					re	tuono.
		10368	F					ut	tuono.

DI GUIDONE ARE-
condo le divisioni
nel genere
nico.

Nete fynon.
Parant. fynon.
Tuono.
Trite fynon.
Mef.

Zarlino, *Le Institutioni Harmoniche*, 104, Venice, 1558

Zarlino presents the double octave + tone with the *Timaeus*' numbers, those used by Proclus and Timaeus of Locri, and depicted it as the Pythagorean diatonic. While we don't mean to present Zarlino as evidence for an explanation of Proclus' interpretation, we present this diagram in order to show how the fifth+double octave+tone arrangement is similar to Proclus' explanation of the *Timaeus* scale. Although the comparison between Renaissance scales and the interpretation of the scale of the *Timaeus* in Proclus, shows very interesting similarities, we are aware that the comparison is not sufficient to validate an interpretation of Proclus' text. 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.⁴⁵ For these authors explicitly continue a long Neopythagorean tradition both in Latin, including Boethius, Macrobius, Martianus Capella the sources mentioned above, following and in the Greek authors known to philosophers such as Ficino.

⁴⁵ Cf. J. Haar (1974) "The Frontispiece of Gafori's *Practica Musicae* (1496)", *Renaissance Quarterly*, Vol. 27, No. 1 (Spring), 7-22 (also included in Haar, 1998, n. 39 above).