

# Platonic Eurhythmmy (4<sup>th</sup> century BC) - part 3

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## Eurhythmmy as Mathematical Order - Philebus and Timaeus (bet. 361-347 BC)

To conclude this chapter, I would like to come back to a question we left open in the second section. We saw that the dialogues of the early and middle periods do not provide us with many clues on the role of mathematics in Plato's rhythm theory and therefore in his larger aesthetic, ethical and political conception of eurhythmmy.

Concerning the reference in *The Republic* to simple mathematical ratios imitated from the Pythagorean theory of harmony, we have noticed that specialists emphasize that ancient Greek music was neither composed nor played according to regular measure. Therefore empirical evidence seem to go against any Platonic use of number to define rhythm, at least in *The Republic*.

But this argument is maybe weaker than it seems. Actually new theories never reflect given common historical practices. On the contrary, as Bachelard convincingly showed already a long time ago, such theories are usually based on propositions that conflict with largely shared opinions. If ancient music and dance were not based on numbers, which is probably true, it does not imply that Plato could not imagine that they should be.

Fortunately, dialogues of Plato's late period are more specific on this subject. As we already saw in the previous chapter, in *The Philebus*, as in *The Republic*, Plato first defines rhythm in respect to harmony. Sound intervals (διαστήματα - *diastēmata*) are endowed with arithmetical properties that explain the harmonious qualities of their combinations. "Correspondingly," the movements of a dancer's body are "measured by numbers" and therefore, when they develop harmoniously, their combinations or more precisely their concatenation can "be called rhythms and measures."

**Socrates** — But, my friend, when you have grasped the number and quality of the intervals of the voice [διαστήματα - *diastēmata*] in respect to high and low pitch, and the limits of the intervals, and all the combinations derived from them, which the men of former times discovered and handed down to us, their successors, with the traditional name of harmonies [ἁρμονίας - *harmonías*], and also the corresponding effects in the movements of the body [ἔν τε ταῖς κινήσειν αὐ τοῦ σώματος - *én te taís kinêsesin aú tou sômatos*], which they say are measured by numbers and must be called rhythms and measures [ῥυθμούς καί μέτρα ἐπονομάζειν - *rhuthmoús kaí métra eponomázzein*—and they say that we must also understand that everyone and many should be considered in this way— when you have thus grasped the facts, you have become a musician, and when by considering it in this way you have obtained a grasp of any other unity of all those which exist, you have become wise in respect to that unity. (*Philebus*, 17c-e, transl.

Harold N. Fowler)

But, further down in the dialogue, Plato specifies the nature of the harmonious concatenation that can be called “rhythm.” Rhythm is a phenomenon that belongs to a class formed “by combining” the “infinite” and the “finite.”

**Socrates** — We said that God revealed in the universe two elements, the infinite [τὸ μὲν ἄπειρον - τὸ μὲν ἀπειρον] and the finite [τὸ δὲ πέρασ - τὸ δὲ πέρασ], did we not?

**Protarchus** — Certainly.

**Socrates** — Let us, then, assume these as two of our classes, and a third, made by combining these two. (*Philebus*, 23c, transl. Harold N. Fowler)

Numbers make this “mixture” possible. The third class to which rhythm belongs is that of “the equal and double and everything which puts an end to the differences between opposites and makes them commensurable and harmonious by the introduction of number.” i.e. the arithmetical proportions.

**Socrates** — The class of the finite, which we ought just now to have reduced to unity, as we did that of the infinite. We have not done that, but perhaps we shall even now accomplish the same end, if these two are both unified and then the third class is revealed.

**Protarchus** — What third class, and what do you mean?

**Socrates** — The class of the equal and double and everything which puts an end to the differences between opposites and makes them commensurable and harmonious by the introduction of number. (*Philebus*, 25d-e, transl. Harold N. Fowler)

“The acute and the grave” (pitch) and “the quick and the slow” (rhythm) which are by nature “infinite” or “unlimited” are transformed by the introduction of the “finite” or the “limited” into them into harmony and eurhythm. Hence in art but also more generally, all beauties and perfections depend on the “mixture” of these two basic ontological elements.

**Protarchus** — I understand. I think you mean that by mixture of these elements certain results are produced in each instance.

**Socrates** — Yes, you are right.

**Protarchus** — Go on.

**Socrates** — In cases of illness, does not the proper combination of these elements produce health?

**Protarchus** — Certainly.

**Socrates** — And in the acute and the grave, the quick and the slow, which are unlimited [ἀπείροις], the addition of these same elements creates a limit and establishes the whole art of music in all its perfection, does it not?

**Protarchus** — Excellent. (*Philebus*, 25e-26b, transl. Harold N. Fowler)

As we will see very soon in *The Timaeus*, numbers are intermediate entities in a larger cosmogony. Through them, rhythm is finally explained by the doctrine of the *ápeiron*, viz. the formless, vague, indefinite, unlimited, infinite of more or less, into which the *métrion*, viz. order, harmony, measure, symmetry, law are introduced by the limiting *péras*, the *definite* principle. As a matter of fact both doctrines of number and unlimited/limited are borrowed from the Pythagoreans and applied, among other things like health and weather, to music and dance. In *The Philebus* mathematics becomes maybe for the first time central in the definition of rhythm.

In *The Timaeus* the use of number to define the cosmic rhythms and its link to Pythagorean theories have been regularly alleged by ancient commentators like Plutarch (46-126 AD), Chalcidius (ar. 321 AD), and Proclus (412-485 AD). In the 1930s, Matila Ghyka even claimed that Plato conceived of the “rhythm of the universe’s soul” as organized according to numbers and especially one in particular that, after Cook, he called  $\Phi$  or “golden number” (Ghyka, 1931, chap. 1, p. 29 sq.).

However the myth of the “golden number” and its ethical and political implications has been historically scrutinized and efficiently deconstructed (Neveux, 1995). On the philological level, Pierre Sauvanet has underlined the fact that Plato uses the term *eurhythmia* only for denoting phenomena belonging to the anthropological sphere (dance, music, poetry, education) and never for those in heaven (the circles in which planets and stars move) which are perfect by nature and which he denotes as *períodos* (Sauvanet, 1999, p. 73 *et sq.*). Contrary to a popular opinion that seems to date mainly from the 19<sup>th</sup> century, Plato is nowhere advocating a “universal eurhythmia” which seems to rely more on approximate translation and imaginary projection than on real Platonic concept. The extension of eurhythmia to the cosmos seems to have been made much later on.

But this does not mean either that Plato does not think of some genuine relation between the human rhythmic movements and the cosmic periodic order. The definition of rhythm given in *The Republic* and *The Laws* as “order of motion” cannot be completely severed from the mathematical cosmogony initiated in *The Philebus* and developed in *The Timaeus*.

Let us examine the evidence. In *The Timaeus* Plato presents a story that explains the construction of the Cosmos by the Father of all things, the Demiurge, while he was “gazing” at Forms of which “this Cosmos should be a copy.”

It is clear to everyone that his gaze was on the Eternal; for the Cosmos is the fairest of all that has come into existence, and He the best of all the Causes. So having in this wise come into existence, it has been constructed after the pattern of that which is apprehensible by reason and thought and is self-identical. Again, if these premisses be granted, it is wholly necessary that this Cosmos should be a Copy of something. (*Timaeus*, 29a-b, trans. W.R.M. Lamb)

But Plato is no mere creationist. The apparition of the Cosmos implies, as in *The Philebus*, the imposition of order (*táxis*) onto “restless” things which already existed and were “in a state of discordant (*plémmelôs*) and disorderly (*atáktos*) motion” or simply “lack of order” (*ataxías*).

For God desired that, so far as possible, all things should be good and nothing evil; wherefore, when He took over all that was visible, seeing that it was not in a state of rest [*οὐχ ἡσυχίαν*] but in a state of discordant [*πλημμελῶς* - lit. out of tune] and disorderly [*ἀτάκτως* - lit. not in battle-order] motion [*κινούμενον*], He brought it into order [*τάξιν*] out of disorder [*ἐκ τῆς ἀταξίας*], deeming that the former state is in all ways better than the latter. (*Timaeus*, 30a, trans. W.R.M. Lamb)

The material world which was still “in a state devoid of reason or measure” (*alógos kai amétrôs*) was then fashioned and shaped by Demiurge “by means of forms and numbers” (*éidesí te kai arithmoís*).

Before that time, in truth, all these things were in a state devoid of reason or measure [*πάντα ταῦτ' εἶχεν ἀλόγως καὶ ἀμέτρως*] but when the work of setting in order this Universe was being undertaken, fire and water and earth and air, although possessing some traces of their own nature, were yet so disposed as everything is likely to be in the absence of God; and inasmuch as this was then their natural condition, God began by first marking them out into shapes by means of forms and numbers [*διεσχηματίσατο εἶδεσί τε καὶ ἀριθμοῖς*]. (*Timaeus*, 53a-b, trans. W.R.M. Lamb)

What does “shaped by means of forms and numbers” exactly mean? According to Aristotle, Plato thinks of numbers as intermediary entities between the Forms, which are “the causes of everything else,” and the sensible things, which “participate in them.” Although he disagrees with the Pythagoreans, on the one hand, on the nature of the original Unlimited which he posits as a duality—the “Great and Small”—and not as a singularity, and on the other hand, on that of the sensible things, which he holds as distinct from numbers, he agrees with them “in stating that the numbers are the causes of Being in everything else.”

Plato states that besides sensible things and the Forms there exists an intermediate class, the objects of mathematics, [arithmetical numbers and geometrical figures] which differ from sensible things in being eternal and immutable, and from the Forms in that there are many similar objects of mathematics, whereas each Form is itself unique.

Now since the Forms are the causes of everything else, he supposed that their elements are the elements of all things. Accordingly the material principle is the “Great and Small,” and the essence is the One, since the numbers are derived from the “Great and Small” by participation in the One. In treating the One as a substance instead of a predicate of some other entity, his teaching resembles that of the Pythagoreans, and also agrees with it in stating that the numbers are the causes of Being in everything else; but it is peculiar to him to posit a duality instead of the single Unlimited, and to make the Unlimited consist of the “Great and Small.” He is also peculiar in regarding the numbers as distinct from sensible things, whereas they hold that things themselves are numbers, nor do they posit an intermediate class of mathematical objects.

(*Metaphysics*, 1.987b, trans. Hugh Tredennick)

It seems that Plato is regarding the Earth as stationary and set at the center of the Cosmos whose movements are compared *metaphorically* to “choric dances,” that is endowed with harmony and rhythm.

And Earth, our nurse, which is globed around the pole that stretches through all, He framed to be the wardress and fashioner of night and day, she being the first and eldest of all the gods which have come into existence within the Heaven. But the choric dances of these same stars and their crossings one of another, and the relative reversals and progressions of their orbits, and which of the gods meet in their conjunctions, and how many are in opposition, and behind which and at what times they severally pass before one another and are hidden from our view, and again re-appearing send upon men unable to calculate alarming portents of the things which shall come to pass hereafter,—to describe all this without an inspection of models of these movements would be labor in vain. (*Timaeus*, 40b-d, trans. W.R.M. Lamb)

But in other instances Plato is a little more specific about the “choric dance” of the stars which appears actually to be perfectly circular.

For movement He assigned unto it that which is proper to its body, namely, that one of the seven motions which specially belongs to reason and intelligence; wherefore He spun it round uniformly in the same spot and within itself and made it move revolving in a circle; and all the other six motions He took away and fashioned it free from their aberrations. (*Timaeus*, 34a, trans. W.R.M. Lamb)

Hence among the things belonging to the imperfect transient human Lower World that were organized or shaped in respect to numbers there was Time itself, according to which things are generated, maintained then destroyed. Time was made as “a movable image” of Eternity “moving according to number [*kat’ arithmòn iôusan*].” The term “rhythm” itself is not present in this instance but it is likely that “number” is used *instead*, i.e. precisely where other philosophers used it in order to denote the *multiple manners* of the becoming. We do not know for sure if Plato was already thinking to the play on words assimilating *rhuthmós* to *arithmós* which will later become usual, but it is quite possible. Anyhow the becoming now flows according to the most perfect rhythm: the numbered Time.

But inasmuch as the nature of the Living Creature was eternal, this quality it was impossible to attach in its entirety to what is generated; wherefore He planned to make a movable image of Eternity, and, as He set in order the Heaven, of that Eternity which abides in unity He made an eternal image, moving according to number [*κατ’ ἀριθμὸν ἰοῦσαν*], even that which we have named Time. (*Timaeus*, 37d, trans. W.R.M. Lamb)

All this results in one ethical contention. In order to take good care of our soul, we must try to make

the cyclical movements of the human microcosm tune with those of the larger macrocosm which are organized according to “the revolutions [in the classical sense of cycle/rotation/going round in an orbit] of reason.”

God devised and bestowed upon us vision to the end that we might behold the revolutions [περιόδους] of Reason in the Heaven and use them for the revolvings of the reasoning that is within us, these being akin to those, the perturbable to the imperturbable; and that, through learning and sharing in calculations which are correct by their nature, by imitation of the absolutely unvarying revolutions of the God [τοῦ θεοῦ πάντως ἀπλανεῖς οὔσας - lit. the God in all ways stays fixed] we might stabilize the variable revolutions within ourselves [ἐν ἡμῖν πεπλανημένας - en êmîn peplanêménas lit. In what indeed makes me wander]. (*Timaeus*, 47b-c, trans. W.R.M. Lamb)

Hence if rhythm is the “order of motion” of the dancers as mentioned in *The Laws*, 2.665a, if that order reflects and influences the variable “disposition of the character and the mind” as explained in *The Republic*, 3.400e, if therefore the State must rhythmically control and shape the body and the mind of the citizens as explained at length in *The Laws*, book 2, and finally if “the variable revolutions within ourselves” should try to replicate “the absolutely unvarying revolutions of the God” as suggested in *Timaeus*, 47c, we may conclude that the first three levels—Body, Mind and Society—should be regulated according to the perfect geometrical and arithmetical order of the fourth. Rhythm as harmony in dancing and song, along with speech, which have been “bestowed upon us by the gods” to mend our “ametical condition,” should try to imitate cyclical repetitions (*períodos*) and the perfection of the series of rational numbers. For the first time in the West, the rule according to which *eurhythm* is to become *eumeter*, i.e. due measure, and body and soul to be *metrified*, i.e. ordered according to number, is legitimized by a complete cosmological conception.

Concerning sound also and hearing, once more we make the same declaration, that they were bestowed by the Gods with the same object and for the same reasons; for it was for these same purposes that speech was ordained, and it makes the greatest contribution thereto; music too, in so far as it uses audible sound, was bestowed for the sake of harmony. And harmony, which has motions akin to the revolutions of the Soul [τῆς ψυχῆς περιόδοις - tês psukhês perídois] within us, was given by the Muses to him who makes intelligent use of the Muses, not as an aid to irrational pleasure [ἡδονὴν ἄλογον], as is now supposed, but as an auxiliary to the inner revolution of the Soul, when it has lost its harmony, [ἀνάρμοστον ψυχῆς περίοδον - anármoston psukhês perídon] to assist in restoring it to order and concord with itself. And because of the [ametical/irregular/erratic] [ἄμετρον - ámetron] condition, deficient in grace, which exists in most of us, Rhythm [ῥυθμὸς] also was bestowed upon us to be our helper by the same deities and for the same ends. (*Timaeus*, 47c-e, trans. W.R.M. Lamb, my mod.)

As in *The Laws*, harmony and rhythm are gifts of the gods which aim at infusing measure and grace into men in order to help them to “imitate the divine harmony.”

Thus from shrill and deep they [the slower and the quicker sounds] blend one single sensation, furnishing pleasure thereby to the unintelligent, and to the intelligent that intellectual delight

[εὐφροσύνην] which is caused by the imitation of the divine harmony [θείας ἀρμονίας μίμησιν] manifested in mortal motions [ἐν θνηταῖς γενομένην φοραῖς παρέσχον]. (*Timaeus*, 80b, trans. W.R.M. Lamb)

If we now look at ancient Greek philosophy from a more distant viewpoint, we can glimpse a tremendous shift. Rhythm is not only an aesthetic problem concerning “the importance of music in education.” Rather rhythm is probably one of the most important issues on which Plato bases his critique of Heraclitus’ and Democritus’ doctrines. Rhythm henceforth bestowed upon humans by the gods and the State, organized as meters, regular measures, rational proportions, imitating on earth the periods of the heavenly bodies presented as their Forms, is the Platonic polemical response to the previous ontology and epistemology of the flow.

As a matter of fact, it is no chance that Plato spends so much time and proves so careful on discussing the concept of *rhuthmós*, which was probably a quite common and significant feature of the various doctrines before him. Due to its morphology it was particularly akin to Heraclitus’ famous *pánta rheî*, everything flows, which is quoted in *Cratylus* and in *Theaetetus* either with a little bit of sarcasm: *pánta ôsper kerámia rheî*, “all things are flowing like leaky pots,” (*Crat.* 440c-e); or through dance and theater metaphors (*iénai* - go; *khôrei* - make room for another, move on; *kinêtai* - set in motion): *tà ónta iénai te pánta kai ménein oudén*, “all entities move and nothing remains still” (*Crat.* 401d); *pánta khôrei kai oudèn ménein*, “everything changes place and nothing remains still” (*Crat.* 402a); *pánta kineîtai*, “all things are in motion” (*Theaet.* 183a). Naturally it was also akin to Democritus’ theories of the fall of atoms in the void and world formation through vortices, even if Plato apparently and puzzlingly never said a word about it.

Hence, as emblem of most philosophers giving primacy to Becoming upon Being, once re-formulated as *kinêseos táxis*, order of motion/ movement, *rhuthmós* was a major piece of loot enabling to set again the Becoming under the rule of the eternal and unchangeable Being through a “a movable image [of It], moving according to number.” And the danger of Heraclitus’ and Democritus’ doctrines for the moral and political good of the State could be efficiently repelled.

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