Christian Rhythm at the End of Antiquity (4th - 6th cent. AD) - part 2

- Recherches

- Vers un nouveau paradigme scientifique ?

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Rhuthmos

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Rhythm as Divine Arithmetic - Augustine's _De musica_, 1

After these introductory considerations, let us look now more precisely at Augustine's theory of rhythm. "Regulated movement" means, he says, "rhythmical succession of times and rests" which brings us pleasure. On the contrary, "the same movement does not seem right when it is irregular." Here Augustine is very close to the Greek opposition between rhythm and arrhythmia and one could with no trouble translate _ineptus_ with arrhythmic, i.e. chaotic.

> **Master**. Music is science of regulated movement _[Musica est scientia bene movendi]_. As a matter of fact, we may say that the movement is regulated, when one observes the rhythmical succession of times and rests _[quidquid numerose servatis temporum atque intervallorum dimensionibus movetur]_: for they then please us and may without inconvenience be called modulation _[modulatio]_. [...] But the right modulation _[bona modulatio]_ belongs only to that liberal art which we call music. The same movement does not seem right _[bona]_ when it is irregular _[inepta est]_, although it seems to conform to the art of rhythm _[quamvis artificiose numerosam esse fateare]_. (_De musica_, 1.3.4, my trans.)

Using the traditional Platonic and Aristotelian method for reconstructing a phenomenon from its smallest constituent parts, Augustine introduces the idea of the simplest difference in perception of time. This starting point based on perception of time is important because it will be used later, as we shall see, to characterize the inner life of the soul.

> **Master**. Let us agree, then, to call these opposite terms long and short, slow and quick _[diu et non diu, tarde et velociter]_. And first, let us discuss about the long and short times in movement _[de diuturno et non diuturno]_. **Student**. I agree. (_De musica_, 1.7.13, my trans.)

Exactly as in Aristoxenus, the full duration is thus recreated from the succession of time-lengths and their proportions.

Master. It is possible to measure and divide the long and short times of movement according to their ratio, first, as 2 is to 1, that is, when one is twice as long as the other one. Second, as 3 is to 2, in other words, when one contains three intervals of time *[partes temporis]* which are as long as the two intervals contained by the other. We can thus give an account of all rhythms, leaving nothing vague and indeterminate in their scale, and set a figure to designate the ratio between two movements. (*De musica*, 1.8.14, my trans.)

After this objective and quite classical reconstruction of duration, Augustine addresses as expected the issue of value. To explain what he will expose, as Plato in the *Philebus* (23c *sq.*), he introduces first the ancient notions of limit and that which is limitless, measure and that which is immeasurable (see above chap. 2).

> **Master**. You also understand, I think, that anything that admits right measure is preferable to that which is immeasurable and unlimited. **Student**. This is obvious. **Master**. Consequently two movements which have, as we have said, a common measure are preferable to those which do not. **Student**. That is a very clear to me. They are united by the measure and proportion of numbers, while the latter are united by no relation. **Master**. Let us call, if you will, rational, the movements, which can be measured in respect to one another and irrational those who do not admit a common measure. (*De musica*, 1.9.15, my trans.)

Naturally only simple, i.e. "rational" proportions are acceptable and beautiful. Any other kind of fraction does not allow to correctly organize a succession of time-lengths. All Archimedean mathematics has been forgotten.

> **Master**. By speaking of fraction, I mean an irreducible fraction like 1/2, 1/3, 1/4, 1/6, without needing to add either a tenth, a twentieth, or any fractional number. **Student**. I understand. **Master**. Among these rational [but] unequal movements, of which I have distinguished two species by taking numbers as example, what are those you judge the most perfect? Those where the proportions can be established by exact fractions [as 2, and 4, 6, 8 - example given above by A.], or those that are not susceptible of a common measure [as 3 and 10, 4 and 11 - example given above as well by A.]? **Student**. It seems to me that reason requires that those in which it is possible to say which fraction of itself is greater or equal to the smallest, are preferable to those which do not present that character. (*De musica*, 1.9.15-16, my trans.)

But Augustine plays also with the possibilities given by Latin language which designates both nouns "rhythm" and "number" by the same word *numerus*, as well as the adjectives "rhythmic" and "numerous" by *numerosus*, to elaborate a second criterion of value which will prove to be much more original.

Since rhythm and number participate in each other, mere rhythm or at least mere rhythmical order of time-lengths, he says, can be extended *ad infinitum* just like the series of numbers. Therefore, rhythm need the time-lengths be checked by "a certain measure and form" which introduces a limit within them.

> **Master**. Don't you see that the rational movements *[rationabiles motus]*, that is, having a numerical/rhythmical relation between them *[qui ad sese habent aliquam numerorum dimensionem]*, can, with these numbers, extend to infinity *[in infinitum]*, if they do not meet, through a fixed rule, a limit which arrests them and imposes on them certain measure and form *[ad quemdam modum formamque]*? (*De musica*, 1.11.18, my trans.)

This view is clearly reminiscent of Plato's doctrine exposed in the *Philebus*. We remember that for Plato rhythm was a phenomenon that belonged to a class formed "by combining" the "infinite" and the "finite." It gave form to that which

was informal *(apeíron)*. Thanks to the introduction of the "finite" or the "limited" under the guise of rational numbers, "the acute and the grave" (pitch) and "the quick and the slow" (rhythm) which were by nature "infinite" or "unlimited," were transformed into "harmony" and "measured rhythm." Only those who grasped that fact became real "musicians" and "wise in respect to that unity."

> **Socrates** But, my friend, when you have grasped the number and quality of the intervals of the voice 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, and also the corresponding effects in the movements of the body, which they say are measured by numbers and must be called rhythms and measures and they say that we must also understand that every one 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 Augustine is more specific than Plato in his use of arithmetic. These interior limiting principle can be found first, by analogy, in the decimal system which reintroduces into the infinite series of numbers, which grows out of 1, the possibility to reduce it back to 1 again.

> **Student**. What is finally the rule *[rationem]* which brings this infinite progression back into itself to a definite measure and form *[ad certum modum formamque]*? That's what I'm eager to know. [...] **Master**. In the first place, must we, because it is a question of rhythmical [or numerically ordered] movements *[de numerosis motibus]*, consult the numbers themselves *[numeros]*, to apply to these movements the absolute and invariable rules *[leges certas fixasque]* which we discovered and observed in them? **Student**. I agree. In my opinion, we cannot proceed more methodically. **Master**. Well! Let us go back then to the very principle of numbers, and see, according to the scope of our intelligence, why we have singled out certain degrees in the unlimited scale of numbers that enable us to go down again to unity which serves as their origin. So, when counting, we first go from 1 to 10, then we go back down from 10 to 1. If you want to follow the series of tens, 10, 20, 30, 40, you come up to a hundred. If you go through the series of hundreds, 100, 200, 300, 400, you find, at the number thousand, a sort of landmark, which will allow you to go down again. (*De musica*, 1.11.19, my trans.)

The next step in Augustine's reasoning makes clear what he is aiming at. After having shown the primacy of number 1, which thanks to the decimal numbering system, generates, according to him, the infinite series of numbers, he argues for number 3.

Master. So, any whole is composed of a beginning, a middle, and an end?   **Student**. Yes.   **Master**. Tell me now, by what number could you designate the beginning, the middle and the end?   **Student**. You probably want me to quote number 3, because your question includes a triple object   **Master**. Very well. So you see in the number 3 a certain perfection, because it has them all at once *[quia totus est]*: it has a beginning, a middle and an end.   **Student**. I can see that. (*De musica*, 1.12.20, my trans.)

A Trinitarian Christian belief, asserting one God in three persons, is here clearly at work in addition with the Platonic paradigm and provides the ultimate value criterion to Augustine's rhythmology, which is clearly an arithmology. Its technical base is undoubtedly Platonic and Aristotelian but the ethical and religious meaning it is endowed with is entirely new. The Trinitarian God reveals himself through the decimal and ternary principles which provide, from within the numbers, "form and measure" to rhythms which otherwise would be limitless and therefore shapeless. Unsurprisingly, the beauty of this Divine arithmetic rhythmic which, alien to Archimedes' mathematics, knows only of natural numbers cannot inspire anything but admiration and love to the human beings.

> **Master**. There is, therefore, a great harmony *[magna concordia]* between the first three numbers. We say 1, 2, 3, without being able to intercalate between them any number. Moreover, 1 and 2 make 3? **Student**. Yes, this relationship is wonderful. **Master**. Is it not also remarkable that the closer and intimate *[arctior atque coniunctor]* the agreement is, the more it tends to a certain unity and forms a certain unity out of plurality *[et unum quiddam de pluribus efficit]*? **Student**. It is a very striking thing, and I admire and love, I do not know why, the unity whose beauty you make me feel *[et nescio quomodo, et miror, et amo istam quam commendas unitatem]*. (*De musica*, 1.12.22, my trans.)

After these mixed elevated considerations, Augustine finally comes back to common musical rhythm. The pleasure felt at a dance performance or while hearing a music piece is brought about by the proportions between time-lengths, the feet they form, and that are recognizable thanks to the beating of time or the succession of dance movements. But even people who are ignorant of rhythm theory can feel rhythm and find pleasure in hearing music or seeing dance, even if in a much less elaborated way than educated ones.

> **Master**. Well! If one would beat time *[numerose plaudat]* so that one beat would last one time, and the other two, which would be a iambic feet *[iambos pedes]*, and if he would continue in such a way, while a person would perform a dance according to these sounds *[ad eumdem sonum saltet]* and move his members according to these times *[secundum ea scilicet tempora movens membra]*, could you not recognize the character of this time measure *[ipsum modulum temporum]*, I mean, the alternating succession of one and two times, whether in the beating of time *[in illo plausio]* or in the dance *[sive in illa saltatione]* that would strike your eyes? At least, would you not find some pleasure in this eurhythmy that your senses perceive *[aut saltem delecteris numerositate quam sentias]*, while being incapable to explain the numerical relation which characterizes its measure *[tametsi non possis numeros eius dimensionis edicere]*? **Student**. You're right. For those who know about numerical proportions *[hos numeros]* feel them in time beating and dance *[sentiunt eos in plausu atque saltatione]*, and express them easily, while those who do not know them and are incapable of naming them, do not fail yet to recognize that they find a certain pleasure in them. (*De musica*, 1.13.27, my trans.)

This leads Augustine to the next Book where he discusses the signals that allow to recognize rhythm and meter and subsequently God's divine arithmetic.

Rhythm *vs* Meter - Augustine's *De musica*, 2, 3

In Book 2 Augustine first contrasts, as many of his predecessors, especially Quintilian (see above), rhythm and meter. Meter, he argues, is based on mere human and historical convention. Grammarians only rely on tradition to determine if a particular syllable must be short or long. Their perspective is hampered by earthly concerns and lack rationality. Instead, since it pertains to mathematics, rhythm is based on reason and divine perfection. That is why musicians feel rightly musical rhythm to be more important than meter and therefore accept that certain grammatically short syllables be chanted as long, while some long syllables as short.

> **Master**. To prove that this syllable must be short, the grammarian will allege that the ancients, in the works that they have left us and which have been commented by the grammarians, have made this syllable short and not long. Here, then, authority *[auctoritas]* is the only rule. As for music, which is concerned in words only with their rational measurement and rhythm *[ad quam dimensio ipsa vocum rationabilis et numerositas pertinet]*, it simply requires that a syllable be long or short according to the place assigned to it by its arithmetical measures *[secundum rationem mensurarum suarum]*. Should you put the word *cano* in a place where it takes two long syllables and lengthen the pronunciation of the first syllable which is short, the musician would not be offended, for the ears would be struck as long as the rhythm requires *[quae illi numero debita fuerunt]*. (*De musica*, 2.1.1, my trans.)

This triggers a series of questions: what is the relation between meter, that is used only in poetry, and rhythm, which seems more common in what we call music? Are they completely at odds with each other or do they bear some resemblance? Is poetry always without rhythm and music without meter? Or can we observe both in each art? But then, if they exist simultaneously, in what way do they differ?

To answer these questions Augustine resumes his previous analysis of proportion between time-lengths in movement and applies it to the succession of syllables. The Aristoxenian model is extended to metrics.

> **Master**. Tell me. Shouldn't we begin by comparing the syllables between each other, and seeing their rhythmical/ numerical relations *[quos numeros ad sese habeant]*, as we have already done with regard to movements? Now, everything that sounds is moving and the syllables are sound. Can you deny that?
> **Student**. No.   **Master**. Thus, comparing syllables is comparing movements in which the rhythmical/numerical time relationships can be converted into measures of [syllable] duration *[in quibus possint numeri quidam temporis mensura diuturnitatis inquiri]*. (*De musica*, 2.3.3, my trans.)

As in Aristoxenus, meters and rhythms are based, according to the quantitative prosody of classical Greek and Latin, on the "minimal" time-length unit: the short syllable. Then the master suggests to "proceed from the short to the long" and recalls the traditional equivalence of one long syllable with two times.

   Master. It is therefore possible, without inconvenience, to call with the ancients one time *[unum tempus]* this minimum duration *[hoc in tempore quasi minimum spatii]* occupied by a short syllable, for we proceed from the short to the long.   **Student**. That is true.   **Master**. This observation calls another remark. If in numbers the first progression is from 1 to 2, in the syllables, where one goes from the short to the long, the long must contain two times. Consequently, if the duration comprised in one short syllable is well termed one time, the duration that includes a long syllable will be very well termed two times.   **Student**. Perfectly! Nothing more reasonable, I confess. (*De musica*, 2.3.3, my trans.)

The lesson goes on with the detailed description of the various genera of feet composed of two (2.4.4), three (2.5.6), and four syllables (2.6.9). Traditional feet names and their respective durations are recalled a little further down Augustine mentions 28 of them: pyrrhic (u u / 2 times), iambus (u - / 3 times), trochee (- u / 3 times), spondee (- - / 4 times), tribrach (u u u / 3 times), dactyl (- u u / 4 times), amphibrach (u - u / 4 times), anapest (u u - / 4 times), etc. up to the dispondee (- - - - / 8 times) (2.7.15).

 Then Augustine addresses the issue of "verse" *(versum)* which is first simply defined as a larger unit composed of feet.

> **Master**. Well! If we have formed the feet by combining syllables, could we not, by combining the feet, form a certain assembly which should no longer be named by the terms syllable or foot? **Student**. I certainly believe so. **Master**. And what will this assembly be? **Student**. A verse, I suppose. (*De musica*, 2.7.14, my trans.)

But, as in his previous discussion of the difference between rhythm and meter, Augustine evokes the necessity to find a rational rule that would explain the form and the length of verse. Otherwise, the latter would be determined only by sheer caprice and convention.

> **Student**. No. It will not suffice for me to see feet, which are indiscriminately intermingled or placed endlessly in a row, to call them verse. A theory *[disciplina]* must explain the species and the number of feet necessary to make a verse, and it is from this theory that I could judge whether it is indeed a verse which has struck my ear. **Master**. Whatever this theory may be, it must have been established, not by caprice but on principle, the rule and measure which have been imposed on verse. (*De musica*, 2.7.14, my trans.)

This rule seems at first quite benign. It only demands using feet of common types. But that entails a sheer repetition of the same structure, or at least, if the structures are different, constant proportions between them.

Student. I understand. Tell me now which feet are likely to fit each other *[qui sibi pedes copulentur]*. **Master**. Nothing is easier to discover, if you think that regularity and analogy *[aequalitatem ac similitudinem]* are superior to unevenness and lack of proportion *[inaequalitati ac dissimilitudini]*. **Student**. It is a principle that everyone will admit. [...] **Master**. You will therefore not hesitate to combine among them pyrrhics, iambus, trochees or chorees, and spondees. By the same method, you will unhesitatingly associate all other feet of the same species. Indeed, there is a perfect regularity between the feet of the same species and of the same name *[summa aequalitas cum eiusdem generis et nominis pedes sese consequuntur]*. Is that not your opinion? **Student**. That is undeniable. **Master**. Cannot we then legitimately mix different feet, provided that we respect this relation of regularity *[alios aliis pedes aequalitate servata esse miscendos]*? Is there anything more pleasurable to the ear than a combination in which variety is united with unity? **Student**. Nothing is more pleasant. **Master**. And what feet are equal to each other, if not those who have the same measure *[nisi qui eiusdem mensurae sunt]*? **Student**. That is true. **Master**. But does not having the same measure mean having the same number of times *[nisi qui temporis tantumdem occupant]*? **Student**. Yes. **Master**. Thus you will be able to combine between them the feet that have the same number of times, without fear of shocking the ear. (*De musica*, 2.9.16, my trans.)

Once again, rhythm and meter, which first have been distinguished for practical reasons the former being dominant in music, the latter in poetry are actually based on the same theoretical foundation which is a regular and proportionate succession of time-lengths associated in various feet. As a matter of fact, when the succession of feet respects regularity and regularity in the succession of times, they form a "rhythm."

> **Master**. Don't you find in this rhythm *[numerus]* something that pleases your ears? **Student**. Surely everything flows, everything resonates with an infinite charm. (*De musica*, 2.11.21, my trans.)

Rhythm is therefore not absolutely at odds with meter. Nevertheless, the nature of verse is not yet completely clear. The student knows what makes "fine modulation," i.e. rhythm in verse, but so far he does not know what makes such a simple things as verse end.

This is the reason why Augustine comes back to this point in Book 3 and borrows from Quintilian (*De institutione oratoria* 9.4.50 ff.). Rhythm in music does not need to be periodically interrupted as can be seen when musicians "stamp their stools or strike the cymbals with their foot, in a regular rhythm as a matter of fact, and capable of pleasing the ear, but without any interruption." Instead, in poetry, "an uninterrupted rhythm without clearly perceiving where it stops" would be impossible. The use of meter implies that rhythm stop regularly at the end of each line *(finis)*
.

> **Master**. I begin by asking you if it is possible to form, by associating a multitude of compatible feet, an uninterrupted rhythm *[perpetuum numerum]* without clearly perceiving where it stops *[ubi nullus finis certus appareat]*. I mean a rhythm analogous to that produced by the musicians when they stamp their stools or strike the cymbals with their foot, in a regular rhythm as a matter of fact *[certis quidem numeris]*, and capable of pleasing the ear, but without any interruption, in such a way that, without the singing of the flutes, it would be impossible to determine how far this sequence of feet extends and at what point it starts again. (*De musica*, 3.1.1, my trans.)

This analysis will be repeated a little further down by the student who then it is worth noting and I shall come back to this point below uses the term *rhythmus* to name what the Master called *numerus*.

> **Student**. In rhythm *[in rhythmo]*, the combination of feet has no precise boundary *[nullum certum habet finem]*, whilst it stops at a certain limit in meter *[in metro vero habet]*. Consequently any combination of feet can be perceived as rhythm and as meter *[et rhythmi et metri esse intellegitur]*, with the provision that it is unlimited in the former, limited in the latter *[sed ibi infinita, hic autem finita constat]*. (*De musica*, 3.7.15, my trans.)

As we can see, "any combination of feet can be perceived as rhythm and as meter" but the former is characteristic of music which rests on the concatenation of time-lengths into one regular and uninterrupted flow, while the latter is distinctive of poetry which needs, *in addition to that*, periodic endings. But they are not completely foreign to each

other, although there is no symmetry between them. Here again, *rhuthmys*, which Augustine transliterates into *rhythmus*, is explicitly translated as *numerus*. He finds the Latin terms too large and claims that in order "to avoid any ambiguity in the language, it is better to employ the technical terms of the Greeks." Unsurprisingly, when he considers real poetic and musical practices, he is obliged to recognize, with Aristotle, that "every meter is rhythm but every rhythm is not meter" (see chap 3). The former is a larger category than the latter and the latter is included in the former.

> **Student**. I understand. Moreover, I grant you that we may form a series of feet such that we know the number of feet it contains and the term at which it stops to begin again. **Master**. Can you hesitate to admit a combination of this kind, you who see an art in the composition of verse, and recognize the charm which they exert upon you? **Student**. This combination obviously exists and it differs from the one you spoke of first. **Master**. But, since difference in things calls for distinction in terms, you must know that among these two combinations of feet, in Greek, the first is called "rhythm" and the second "meter" *[rhythmum a Graecis; hoc autem alterum, metrum vocari]*. In Latin they could be called, the first "*numerus*," the second "*mensio* or *mensura* - measure" *[illud numerus, hoc mensio vel mensura]*. But as these terms have too large an extension, and it is necessary to avoid any ambiguity in the language, it is better to employ the technical terms of the Greeks. Yet you feel the correctness of these expressions. The series which ought to walk by equal feet and of the same family, has been properly designated under the name of rhythm, i.e. *numerus [rhythmus, id est numerus]*. But as it develops endlessly and does not offer on any foot a prominent and precise limit which serves as its measure, it would be very improperly called a meter *[non debuit metrum vocari]*. As for the meter, it offers a double character: a sequence of regular feet *[et certis pedibus currit]* and a precise ending *[et certo terminatur modo]*. So, it is at once meter *[metrum]* because of its prominent termination *[propter insignem finem]*, and rhythm *[rhythmus]*, because of the regular chaining of its feet *[propter pedum rationabilem connexionem]*. Therefore every meter is rhythm but every rhythm is not meter. And such is in music the extension of the word rhythm that all parts of this art which extends to the more or less long duration of the syllables has been called rhythm. (*De musica*, 3.1.2, my trans.)

In a way, this conclusion is reminiscent of Aristotle's *Rhetoric*. As one may remember, in his treatise Aristotle discussed mainly oratory speech but he addressed the issue of meter as well. For sheer practical reasons, meter should not be used in prose but there was no fundamental difference between meter and rhythm. Meters partook of a more general rhythmic quality: rhythm was "the number belonging to the form of diction, of which the meters with their divisions [were] part." Both rhythm and meter were ways to give "form" *(skhêma)*, "measure" *(rhuthmÌs/métron)*, "limits" *(péraínô/métra)* and number *(arithmÌs)* to speech.

The form of [elocution] should be neither metrical nor without rhythm *[¼®Äµ ¼¼µÄÁ¿½ µ6½±¹ ¼®Äµ ÁÁÅ¸¼¿½ - mête émmetron eînai mête árruthmon]*. If it is metrical, it lacks persuasiveness, for it appears artificial, and at the same time it distracts the hearer's attention, since it sets him on the watch for the recurrence of such and such a cadence; [...] If it is without rhythm *[ÁÁÅ¸¼¿½ - árruthmon]*, it is unlimited *[À-Á±½Ä¿½ - apéranton]*, whereas it ought to be limited *[ÀµÀµÁ¬½¸±¹ - peperánthai]* (but not by meter *[¼t ¼-ÄÁó ´- - mê métrôi dé]*); for that which is unlimited *[Äx Àµ¹Á¿½ - tò ápeiron]* is unpleasant and unknowable. Now all things are limited by number *[ÀµÁ±¯½µÄ±¹ ´r Á¹¼÷ À¬½Ä± - peraínetai dè arithmô pánta]*, and the number *[Á¹¼xÂ - arithmòs]* belonging to the form of diction *[ÃÇ®¼±Ä¿Â ÄÆÂ »-¾µÉÂ - skhêmatos tês léxeôs]* is rhythm *[åÅ¸¼ÌÂ - rhuthmÌs]*, [of which the meters with their divisions are part] *[¿W º±v Äp ¼-ÄÁ± Ä¼®¼±Ä± - oû kaì tà métra tmêmata]*. Wherefore prose must be rhythmical *[åÅ¸¼x½ - rhuthmòn]*, but not metrical *[¼-ÄÁ¿½ - métron]*, otherwise it will be a poem. [Besides, it is not a matter of rhythm in the true sense of the word but of something close to it.] (*Rhetoric.* 3.8.1-3, trans. J.H. Freese, my mod.)

Nevertheless, Augustine's perspective shows a significant shift. Whereas rhythm was considered by Aristotle as the largest category giving limits and measure to speech, now only meter is really achieving this goal. Rhythm is providing order to an endless sequence of time-lengths, as in empirical music; only meter properly organizes language according to the most essential musical rules.

Next chapter