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# Rhythm in Physiology - Peripatetic School's Problems (4th cent. BC)

- Recherches

- Le rythme dans les sciences et les arts contemporains

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Rhuthmos

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NB : This text is a section of larger work on rhythm in Antiquity.

## Rhythm in Physiology - Peripatetic School's Problems (4th cent. BC)

In the *Problems*, which is an Aristotelian or more probably pseudo-Aristotelian collection of questions and answers gradually assembled by members of the peripatetic school, the concept of rhythm mutates again. The gap between the Aristotelian sophisticated analyses developed in *Rhetoric* and *Poetics* and the gross definitions given in passing in this collection suggests that it may have been written by one or several different hands. It also shows the surfacing of a new trend of thought.

Maybe under the influence of possible similar uses by physicians of the Hippocratic school (mid-5th c. to mid-4th c. BC), the term rhythm is now defined as what is "measured by definite [or divided] movement." It is used to denote the regular respiration of runners when they jog without excess : "As soon as they begin to run they breathe, and as their breathing is coming regularly because it is measured by regular movement, it produces a rhythm." When someone is sitting or walking, the rhythm of his/her breath is difficult to observe ; but it is the same if someone runs to fast. Rhythm here clearly means regular repetition of alternate times.

Why do those who are not running under great strain breathe rhythmically [*ἐν τῷ ῥυθμῷ ἀναπνεύουσιν*] ? Is it because all rhythm [*ἅπαντα ῥυθμῶς* - *pâs rhuthmòs*] is measured by definite movement [*ἀπὸ μέρους ἢ ἀπὸ χρόνου ἢ ἀπὸ ἀριθμοῦ* - *hòrisménèi metreítai kinêsei* - lit. *by divided movement*], and the kind of movement that runners make is regular ? So as soon as they begin to run they breathe, and as their breathing is coming regularly because it is measured by regular movement [*ἀπὸ μέρους ἢ ἀπὸ χρόνου ἢ ἀπὸ ἀριθμοῦ* - *ísêi kinêsei metreístai*], it produces a rhythm [*ῥυθμὸν ποιεῖν*]. Or is it because all breathing without qualification is regular in those who employ it naturally and do not hold their breath ? So in those sitting or walking, as the movement of the body is moderate, the rhythm is not obvious [*ἄφαντος ῥυθμῶς*]; while in those running intensely, as our perception cannot follow the movement, we are unable to observe the rhythm of the breathing. But in the one running moderately, the movement, making the measure of breathing perceptible, reveals its rhythm [*φανερὸν ῥυθμὸν*]. (*Problems*, book 5, 882b, trans. Robert Mayhew)

While endorsing the basic Platonic definition of rhythm as "order of movement," *The Problems* show a typical Aristotelian interest for empirical observation. In Book 19, the Platonic question of the relation between musical rhythms, melodies and *ἦθος* - *ethos* - disposition, character, is addressed as a fact granted by observation. But the Aristotelian author reverses the issue : instead of influencing one's character, music can *represent* what we call psychological moods and what the Greeks called ethical character but not "color nor smell nor flavor." As melody rhythm is a movement in sound that has a likeness with to ethical character. It is not clear whether rhythm is only a movement or if it is presupposed to be, as in book 5, a more or less regular repetition of alternate times, but the association with melody suggests that it is the case.

Why does what is heard, alone of perceptible objects, possess ethical character [ $\epsilon\theta\omicron\varsigma \acute{\epsilon}\kappa\eta\iota$  - *êthos êkhei* - lit. *bears, carries character*] ? Indeed, even if a melody is without words, it nonetheless possesses ethical character [ $\eta\mu\acute{o}\varsigma \acute{\epsilon}\kappa\eta\iota \epsilon\theta\omicron\varsigma$  - *homôs êkhei êthos*] ; but neither color nor smell nor flavor possess it. Is it because (*what is heard*) alone possesses movement, though not that which the sound moves in us ? [...] This movement has a likeliness (*to ethical character*) both in the rhythms and in the arrangement of high and low notes, not in their mixture. But consonance has no ethical character. (*Problems*, book 19, 919b, trans. Robert Mayhew)

Why do rhythms and melodies, which are sound, resemble ethical character, while flavors do not, nor colors and odors ? Is it because they are movements, as actions too are ? Now activity is ethical and produces ethical character, but flavors and colors do not act in this way. (*Problems* book 19, 920a, trans. Robert Mayhew)

In the last occurrence in the *Problems*, the author claims that "we enjoy rhythm because it has a recognizable and orderly number and moves us in an orderly fashion." Yet eurhythmia is no longer imitation of the perfect heavenly movements but results from moving according to human nature, i.e. regularly and without excess. "Exercising and drinking and eating in an orderly fashion" helps us to "preserve and improve our nature and power," whereas disorderly behavior "ruins and deranges it." Rhythmicity becomes regularity.

Why does everyone enjoy rhythm and melody [ $\rho\theta\mu\acute{o}\iota$  kai  $m\acute{e}\lambda\epsilon\iota$ ] and in general all concords [ $\acute{\sigma}\upsilon\mu\phi\acute{o}\nu\eta\iota\varsigma$ ] ? Is it because we naturally enjoy natural movements ? Now a sign of this is that children enjoy these straightaway from birth. And we enjoy different types of melody because of habituation. But we enjoy rhythm [ $\rho\theta\mu\acute{o}\iota$ ] because it has a recognizable and orderly number and moves us in an orderly fashion ; for orderly movement is naturally more akin to us than disorderly, and so is more natural. And here is an indication of this : by exercising and drinking and eating in an orderly fashion we preserve and improve our nature and power, but in a disorderly fashion we ruin and derange it : for diseases are movements of the order of the body not in accordance with nature. But we enjoy concord, because it is a mix of opposites standing in proportion to one another. Therefore proportion is an order that is naturally pleasant. (*Problems*, book 19, 920b-921a, trans. Robert Mayhew)

Although rhythm does not play a great role in *The Problems*, this collection constitutes an important token of the spreading and transformation of the concept during the 4th and maybe the 3th centuries BC because we are not sure of the date of their composition. For the first time, at least to our knowledge, rhythm is used outside dance, music and poetry and translated to another field. By using the term rhythm to designate physiological and medical phenomena on the sole ground, as Benveniste put it, that they constitute "continuous activities" that can be divided "by meter into alternate times," *The Problems* initiate a very long process of generalization that will make the concept of rhythm "fit to any reality, be it human or cosmic, cultural or natural, individual or collective, a process that will result much later on in the development of a modern "pan-rhythmism" during the 19th century.

One can now talk about the "rhythm" of a dance, a walk, a song, a diction, a work, anything that requires a continuous activity divided by meter into alternate times. The notion of rhythm is now fixed. From  $\rho\theta\mu\acute{o}\iota$  as spatial configuration defined by the arrangement and proportion of distinctive elements, one reaches the "rhythm" as configuration of movements ordered in time [*la dur\u00e9e*] [...], "all rhythm is measured by definite movement." (Aristotle, *Problemata*, Book 5, 882b 2) (Benveniste, 1966, p. 335, my trans.)

\*

At the end of the 4th century, one can observe the emergence of three opposite trends.

The first is the spreading of the Platonic concept of rhythm. In Aristotle's *Physics* and *Politics* as well as in Aristoxenus' *Elements of Rhythmics* and in the Aristotelian collection of *Problems*, the same common perspective can be found.

1. Although unlike Plato these works emphasize the importance of observation, they again define rhythm as "combination of short and long, or fast and slow segments," "order of movement" or "alternation of time segments," all measured by numbers and now supported by a powerful new theory of form which equates formal and final cause.

Rhythm theory is invaded by both arithmetic and biological paradigms.

2. In addition, this concept is now used to characterize activities which were not yet considered as pertaining to rhythm : respiration, physiology. Eventually, it will be extended by Vitruvius in the same manner to architecture while paradoxically being severed from any relation to time. Clearly, Aristotle, his collaborators and successors have been instrumental in the spreading of what may be called the *metric Platonic paradigm of rhythm*.

The second trend is far less visible. It is composed of scattered innovations which all were made by Aristotle and which deeply yet imperceptibly transformed the concept of rhythm. It has largely been ignored by specialists who, due to lack of strong poetic theory, mainly concentrated on the first. Nevertheless it is of greatest interest to us. We may call it the *poetic Aristotelian paradigm of rhythm*.

1. In *The Politics* Aristotle first endorses Plato's holistic and hierarchical views on politics. The whole is superior to its parts, he says, the state to the households and the households to the individuals. Humans are superior to animals, men to women, adults to children, free men to slaves, Greeks to Barbarians. Nevertheless, when he considers musical rhythm his perspective somehow changes. Unlike his master who was very suspicious about the mimetic power of rhythm, he considers it not only as a powerful means of education of the citizens to be used by the state, but also as a means for the individuals of enjoyment, noble leisure, education of the spirit, and possibly of achieving goodness and excellence. This profoundly humanist and democratic intuition will be lost very soon as the Athenian democracy disappears in 322â€”the same year in which Aristotle passes awayâ€”and monarchies develop in the Greek world. The holistic and hierarchical view that gives to the Platonic rhythm concept its ethical and political color will naturally prevail in a world in which it fits perfectly, but Aristotle alternate suggestion, as we will see, will reappear much later in the West from the 18th century on and nurture new views on the relation between subjectivity, society, state and rhythm.

2. When in *The Rhetoric* Aristotle changes focus from music to public speech, he introduces a second important innovation in rhythm theory. The study of speech makes him realize that the definition of rhythm drawn by Plato from his observation of music and dance and his Pythagorean speculation cannot be applied without change to language. Combination of short and long or fast and slow segments, or order of movement, do indeed partake in speech rhythm but they constitute only part of it. Rhythm appears now as a larger whole that transcends metric elements as well as bodily figures. In addition, Aristotle elaborates further what he already sketched in the *Politics*. Rhythm has the power to shape the *psychè* of the individual that can be used to achieve political endsâ€”a kind of use he does not particularly appreciate but that, as a scientist, he feels compelled to examine due to its prevalence in his timeâ€”or, as he explains in *The Poetics*, larger ethical objectives through *mîmêsis* and *kâtharsis*.

3. In *The Poetics*, Aristotle complements the changes he already sketched in *The Rhetoric* and introduces a third significant innovation. Both essays form a diptych. While the latter transforms the Platonic conception of rhythm into something larger than a mere series of metric elements or bodily figures, the former expands the previous limited utilitarian views of power of rhythm on individual psychesâ€”how to influence an audienceâ€”into a general ethical doctrine that emphasizes the liberating effects of poetic rhythms. "Success" or "beauty" in "poetry in itself" is reached when the *rhythms and tunes* organizing a poetic work are good enough to trigger *kâtharsis* by *re-presenting human actions and emotions*, i.e. not so much by making a faithful copy of them in order to reach the otherworldly ideas of which they are degraded copies, as by *presenting them anew* in order to come closer to *their quintessence*. In *The Poetics*, the concept of eurhythmia, that was so important for Plato, receives a completely new meaning which is not based on *aesthetic pleasure of the spectator*, as for aesthetics, nor even on *persuasion of the audience*, as for rhetoric, but on *the ethical liberating effects produced on each one and all of us by the well rhythmized re-presentation of life*, i.e. the effective presentation of experiences, actions and characters *under new guises*. Thanks to the mediation of this larger rhythm, ethics and politics can now be based on the poetic power of language.

The third trend is a brilliant but limited revival of Democritean atomism with Epicurus (341-270 BC), whose works were unfortunately completely lost except for a few fragments and letters, and one of his followers, the Roman poet Lucretius (c. 99 BC - c. 55 BC). Thanks to his impressive didactic poem *De rerum natura*, we are able to retrace another conception of rhythm which preserves most ancient features of *rhuthmós* while elaborating and developing them anew. This third trend we may call the *physical Democritean paradigm of rhythm*. I would like to sketch now its forgotten history.

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