

Music, otherwise...

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I – A story

The IIXth Century theory proposed by Johanis Doeus, anent to the ways a skilled misolizationist should follow in order to reach the Maestro Musici cum Tonario degree was based on the Limburgish School relationist principle stating that good music is composed of two main intervals (considered as Tactus Sonorus or intervals of reference): the minor and the major second – that related to each other scalarly in a 2 to 1 ratio. Two minor seconds equate a major second. The other intervals possible within a perfect octave, rarely used (some as exceptions, other banned by Papal bullae) represented mere combined superimpositions of the two Tactus intervals.

For instance, a major third was considered a nonsense if taken *per se* – unless seen as an addition of two major seconds, of two minor seconds and one major second or (the case of most early service music) of four minor seconds. However, misolizationists were encouraged to perform any C–E-like interval taking great care to imagine mentally (Elogisatio) the intermediary „D“ note – as the sole possibility to use such a daring intervallic leap.

Johanis Doeus was the first to consider both the minor and the major third as independent intervals or „Tactus Augmentatus“ note-spans. As such he claimed to have accessed directly bizarre intervals (at least for the IIXth Century musical practice) such as the fifth and the sixth. If two seconds may build up a third, two superimposed thirds – not seen anymore as an addition of seconds – may create any interval between the augmented fourth and the major sixth, upon the *sine qua non* condition that these mind-blowing intervals be related, by means of Elogisatio, to the two constituent thirds. Thus, a perfect fifth like C–G was unthinkable unless the intermediary E were not mentally imagined. Doeus' allegations provoked great turmoil within the musico-ecclesiastic community which, in its turn, labeled him as a mere charlatan and decreeing that, no matter the abracadabrant conjectures claimed by „the lunatic of Alden Biesen“, a perfect fifth basically remains an addition of three major and one minor seconds. „A house in made of bricks, not walls“, used to say Doeus' detractors – who had probably never heard of prefabricated panels.

It was only during the IXth Century that misolizationists' descendants recognized Doeus' merits by establishing that any interval up to the perfect fourth can be considered, in itself, a Tactus Augmentatus and that henceforth it may create, by superimposition and Elogisatio, other intervals. This is how the five Tactus intervals – from the minor second to the perfect fourth – still in use today, were adopted by official music theory. Other intervals, such as the fifth, the sixth and the seventh, are theoretically usable as Tactus, but we

hardly find them in actual scores, the same way we rarely use rhythmical values such as the breve the 64th or the 128th.

II – A completely different story

Ever since the beginning of the IIIIXth Century musicians started to wonder why temporal durations shouldn't be related one to another by means of simple arithmetic ratios, other than the 1:1 ratio. Shortly afterwards the Nowehrstadt School even came up with an innovation called „The Rhythmical System of Arithmetically Related Musical Durations“ stipulating that any „rhythmical value“ could generate, by elementary augmentations or divisions, other durations. Thus, what the Nowehrstadt group used to call „fourth note“ could generate not only an isochronous tempo whenever the fourths were simply juxtaposed, but other durational values such as „eighth notes“ (when the fourth note was divided by two; 1:2 ratio) or „second notes“ (when the fourth note was doubled in length; 2:1 ratio). By means of similar artifices other ratios can be deduced: 1:3, 1:4 or even 2:3 or 3:5. During the debates stirred up by the interesting innovation, the inventors of the new system were asked which was the actual duration of a „fourth note“. The answer however baffled the late IIIIXth Century scholars as the Nowehrstadt musicians claimed not only that (1) the *étalon*-value can be embodied without restrictions by durational values other than the fourth note (e.g. the second or the eighth note), but (2) that such a „fourth note“ could last for any time-span that is relevant to musical practice as long as, once a certain duration is established (e.g. 1 fourth note = 600 millisecond), other „rhythmical values“ can be deduced by means of arithmetic proportions. The examples provided included the „second note“ (1200ms), the „eighth note“ (300ms) or even some bizarrely named durational values such as „the dotted eighth note“ (450ms), „the double dotted fourth note“ (1050ms) or „the triolet eighth note“ (200ms).

In order to be of any practical value, the theory should have challenged musicians develop a series of special abilities generically called by the Nowehrstadt scholars as „rhythmical sense“. That would make instrumentalists capable to instantaneously produce durational values inter-related according to the theory. The practical examples provided by those who claimed to have already achieved such dexterities, although promising, created to the qualified audience the sensation of a relatively monotonous music (at least for the contemporary taste), of a cyclical temporality that „somehow resembled the humming and drumming of the recently discovered savages of the Tropicatorial Jungle“.

III – A completely different story – continued

For those among our contemporaries who simply adore music (this ineffable blessing we sometimes call

„The Art of Time“) but have no idea as to the efforts musicians submit themselves to in order to attain mastery, we shall hereby present both the stages they usually follow before being accepted into one of the many Musical Academies and – in accessible terms – the general principles of Temporal Harmony, the basic discipline of this universe that made possible the music of geniuses such as Bachvaldi, Mozartieri, Schubmann, van Braahms or Maghner.

Since early childhood pupils are trained to discern categories of isochronous tempi (i.e. isotempi – tempi composed of identical time-spans). Current musical practice uses 12 such isotempi, ranging from cca 100 and cca 1500 millisecond per pulsation and corresponding to the temporal scope within which musicians can reliably produce such repetitious structures, the faster isotempi being hard to master due to some both psychological and physiological constraints and the slower ones due to certain psychological limitations. Including the 7 subsidiary isotempi (i.e. those lodging *in between* two neighboring, basic isotempi), there is a total of 19 academically accepted isochronous tempi. Most subsidiary isotempi were introduced at the beginning of the last Century by Impressionist composers such as Ravelssy who felt that certain temporalities – that they compared to the natural light in a certain place and at a certain moment of the day – cannot be acceptably depicted by the 12 classical isotempi.

The actual names of the isotempi were subject to quite a few transformations during the past 500 years. Modern-to-contemporary practice has discredited most old explanations regarding musicians' ability to use various isotempi but, out of respect for tradition, kept the obsolete terminology. Thus, old Renaissance theories were catalogued as naive, the Baroque methods as pompous, the Classical explanations as evasive* and the Romanticist treatises as excessive. It was only the Impressionist theory that was fairly considered as impressionistic.

During the Tepid War Century, once with the unprecedented development of the brain sciences, psychophysics, experimental psychology and cognitive musicology, the terminology explaining the 12+7 isotempi managed to link every tempo to corresponding perceptual phenomena (that is what, in reality, all empirically discovered categories of isotempi signify). Thus, although most of the historical terms were preserved, as mentioned, out of commodity and respect for the value of the oeuvres in which one may find them scattered, young musicians learn now that a cat-

egory of isotempi such as „Minima“ (cca 100ms/pulsation) was discerned since Aristocrates (in his „Music of Cubes“ dissertation) just because it corresponds to „the beginning of the central tendency for habitually perceived durations“ (*Fraisse, 1964***), „the beginning of the macro-temporal region that allows for the recognition of temporal features“ (*Roederer, 1975*) or to „the threshold of subjective rhythmization“ (*Bolton, 1894*). The same way, another category of isotempi, „Fluentia“ (cca 190-200ms/pulsation), corresponds to „the minimum duration of the perceptual present“ (*Clynes, 1989; Pöppel, 1988*), „the minimum acton“ (*Clynes, 1989*), „the threshold of (note to note) synchronization“ (*Fraisse, 1982*) or „the minimum interval between two stimuli for subjects to have enough time to transfer their attention from one stimulus to another“ (*Feilgenhauer, 1912*). Other categories of isotempo are explained by other perceptual phenomena. „Continua“ (cca 250ms/pulsation) corresponds to „the threshold between the holistic vs. analytical processing of durations“ (*Michon, 1964*). „Media“ (cca 420ms/pulsation) corresponds to „the sustainable rate of (continuous) attention shift“ (*Fraisse, 1964; Feilgenhauer, 1912*). „Marcia“ (cca 550 ms/pulsation), with its two subsidiary isotempi, „Marcia gaia“ (cca 600ms) and „Marcia funebre“ (cca 650ms), corresponds to „the (central nervous system) resonance“ (*van Noorden & Moelants, 1999*), whereas „Marcia funebre“ in itself corresponds to „the optimal rate of attention-shift“ (*Mager, 1925*) too. „Longa“ (cca 700 ms/pulsation) corresponds both to „the optimum interval for immediate succession“ (*Oléron, 1952*), „the last time interval that does not create the sensation of a temporal gap“ and „the ideal unit of perceptual present“ (*Fraisse, 1964*). „Maxima“ (cca 800 ms/pulsation) corresponds to „the first time interval that creates the sensation of a temporal gap“ (*Fraisse, 1964*) – and so on.

Along the centuries musicians used to distinguish among all categories of isotempi without having knowledge of the psychophysical realities laying behind them. However, modern music schools encourage the ecological explanation of isotempi categorization. In parallel with learning how to discern the 12+7 isotempi, young musicians are taught the corresponding temporal notation, as each isotempo has been allotted (since Renaissance) a certain graphical symbol. Generally, around the end of the third grade pupils are able to juxtapose different isotempi – from simple to complicated – with help from dedicated *études*, such as those composed by Czernnon.

* *That was mainly due to the myth of the „common practice“, according to which the end-of-the-VIIIth-Century composers, whenever confronted with a new score written by their contemporaries, knew very well what the author intended. On the other hand, the educated concert-goers of that period knew precisely what was at stake during any concert and, as a consequence, today we know exactly what late Romaniticists wanted to understand from all this historical conundrum.*

** *All references are real.*

Pianists in general have more to study, as they will have not only to pass lightly from one isotope to another, but also superimpose an isochronous tempo played by one hand over another isotope performed by the other hand.

All pupils who are around 12 years old can recognize upon hearing it, any isotope among the 12+7 and know how to notate it accordingly on the staff. Moreover, they can reproduce all isotopes from memory and, generally, can sight-read scores written in musical tempography – only difficult passages being subject to a deeper study. During the last six years before joining a Music Academy, students are progressively taught notions of Temporal Harmony, a discipline containing a historically and aesthetically validated set of rules pertaining to the ways different isotopes can be juxtaposed or superimposed, about how passages from one isotope to another should be prepared and executed, about the variety of such passages (anticipated, entemporal, *brusquée* etc.), about how many pulsations an isotope must consist of in order to establish a pulse and not to be considered an „isotope *de pasage*“ – and so on.

Moreover, all these rules are constantly contextualized depending on the thesis or arsis (i.e. accent or non-accent) value of pulsations. Students learn to discern among agogical (durational) accents, stress (intensity accent), prosodical, subjective, climactic, „top-down“ and „bottom-up“ accents. Just before graduating high-school students learn how to combine one single duration specific to a certain isotope

with other such solitary durations, specific to other isotopes – an ability that only a few are able to praise themselves with. However, modern composers (especially the Niewese School) endeared such intricacy and produced quasiunpreformable musical compositions in which the durations specific to the 12 isotopes were placed in the score one at a time, in a preestablished series. Although demanding, their music managed to find the right, perfectly time-sensed, interpreters that performed it masterly and even made it appealing to the public.

IV – A completely different story – conclusion

„The Rhythmical System of Arithmetically Related Musical Durations“ proposed more than two centuries ago by the Nowehrstadt School has recently reentered academic debate as musicologists have discovered that the well known entemporal modulations (i.e. passing from one isotope to another by means of a „isotope *de pasage*“ that is related – *voisinée* – to both isotopes between which the passage is being operated) seemed to have long used what the Nowehrstadt scholars used to call „rhythmical sense“. The very concept of „voisinée isotopes“ seems to be based on a natural propensity of our psyche towards arithmetic durational relationships such as those mentioned in section II. Cognitive musicology should make an effort to explain this coincidence and add „The Rhythmical System of Arithmetically Related Musical Durations“ to the existing „Art of Time“ theoretical thesaurus.

References:

- Bolton, T. L. / 1894 / *Rhythm* / *American Journal of Psychology* / vol. 6 / pag. 145-238
- Clynes, M. / 1989 / *Sentics. The touch of the emotions* / Prism Press / Bridport, Dorset, UK
- Feilgenhauer, R. / *Untersuchungen über die Geschwindigkeit der Aufmerksamkeitswanderung* / *Arch. ges. Psychol.* / 1912 / vol. 25 / pag. 350-416
- Fraisse, P. / 1964 / *The psychology of time* / Eyre & Spottiswoode (Publishers)
- Fraisse, Paul / 1982 / *Rhythm and tempo* / *The psychology of music* / D. Deutsch, ed. / New York: Academic Press / pag. 149-180
- London, J. / 2004 / *Hearing in Time: Psychological Aspects of Musical Meter* / Oxford University Press
- Mager, A. / *Neue Versuche zur Messung der Geschwindigkeit der Aufmerksamkeitswanderung* / *Arch. ges. Psychol.* / 1925 / vol. 53 / pag. 391-432
- Michon, J. A. / 1964 / *Studies on subjective duration. I. Differential sensitivity in the perception of repeated temporal intervals* / *Acta Psychologica* / vol. 22 / pag. 441-450
- Oléron, G. / *Influence de l'intensité d'un son sur l'estimation de sa durée apparente* / *Anée psychol.* / 1952 / vol. 52 / pag. 383-392
- Noorden, L. van & Moelants, D. / 1999 / *Resonance in the Perception of Musical Pulse* / *Journal of New Music Research* / Leman, M. & Berg, P. eds; Moelants, D., guest editor / Swets & Zeitlinger Publishers, Lisse, The Netherlands
- Pöppel, E. / 1988 / *What is time? Mindworks Time and conscious experience* / Harcourt Brace Jovanovich, Publishers
- Roederer, J.G. / 1975 / *Introduction to the Physics and Psychophysics of music* / 2nd ed. New York: Springer