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OF THE MUSICAL TRACTATES AT THE DAWN OF MODERN SCIENCE

About the polemics Fludd–Kepler–Mersenne

Introduction

In the beginning of the 17th century—for the first time in history and perhaps in the most evident manner we have had the chance to know—a spinning wheel of dense interference rotates—involving personalities such as Marin Mersenne, René Descartes, Johannes Kepler, Pierre Gassendi, but also Robert Fludd, Michael Maier, Athanasius Kircher, Heinrich Kunrath and others—around the musical idea., a philosophical elaboration, magical hermetical topics, cabbalistic traditions and the birth of modern scientific thought. The present short paper takes its start from these and analogous statements, basing itself on the research work done at the Chair of "History of Scientific Thought" at the Epistemology Department of the Institute of Philosophy of Genova University, a series of studies and intense exploration that has led to stating the sequential substitution of the magical-symbolic constructs by linguistic-formal structures of a musical kind since the early Renaissance. Or at least, these musical or para-musical topics were considered equal to expressly philosophical or religious topics. Thus, with the growth of science and a modern scientific methodology, a theoretical-musical and/or para-musical discussion activity has also been unleashed.

We shall see that after a period rich of stimuli (the 16th century, especially in its second half) the basis of mechanicism, of modern science and—somewhat as a "consequence" thereof—a new gnoseology emerge. On one side, we assist to the structuralization of a tendency to put into the foreground concepts of a proportional/harmonic type, utilizing the extraordinary mytho-poetical capacities of music and its language (on the tracks of the consolidated medieval tradition), legitimizing, for instance, the title of "Harmonie Universelle" that Marin Mersenne will give to a series of his writings. On the other hand, we note the progressive growth of interest in the new-born acoustical science, utilized also as a clue to a Philosophy of Perception in a constant polemics with the animism and the cabbalistic-symbolic thought of the Fluddian type.

The role played here by the musical theory is exceptionally important, and it legitimizes a present-day analysis insofar, as this allows for a precision of the historical foundations as well as for the construction of a musical epistemology, although under a historical matrix which—as we think—today's research does need.

And even methodologically we may confirm that the necessity of such a research—exquisitely connected to the history of science—is based among others upon the evident consideration that the history of science must be considered an essential element of making science.

Furthermore it must be pointed out that the bibliography on these topics is rather meagre, and that the status of research about the historic-methodological aspects in an interdisciplinary view of the links between music, science and philosophy is—to say the least—"ambiguous" for having been nothing but an appendix for too long to a musicology preoccupied more with the musical effects of the writings of than with the aspects concerning the cultural history of Europe in the 16th and 17th centuries, that is of the History of Ideas.

The recent research of the history of science has evidenced the subtle and profound connections linking—at the beginning of the modern age—the philosophical and. religious speculation to the stud of Nature and to the progress in the scientific quest through a mental

disposition that seems to be typical of the Renaissance. Hermetical magic and cabbalistic tradition are—as mentioned before—the original elements upon which an audacious attempt for a cultural and moral renewal is based, finding its primary centers in 17th century Germany, with an adventurous political and cultural design that—relying on the Protestant and "liberal" forces in Europe—sets out to fight the catholic Hapsburgian hegemony and those offensive to the restoration of the Counter-Reformation.

This political operation was defeated in the dramatic events that led to the Thirty-Years' War. The intellectual streams, though, that have formulated the first texts of a renewal of the hermetic tradition—giving birth to the Rosicrucian movement—nevertheless managed to resist to the sometimes ferocious repression unleashed against them, and to deeply influence a vast movement of thought circulating all over 17th century Europe, from France to Italy, and from Germany to England, among others giving life to polemics, by no means dry, that often made use of an argumentation of a musical type, or—more largely—of a harmonical type.

Here, once again, the "musical" literature assumes a noteworthy importance in the development of the cultural history of the Occident; almost a swan song about the dying of the great panharmonic project which had connected oriental and occidental knowledge, preclassical and classical antiquity throughout the Middle Ages to the Renaissance humanism, a death, slow and with the head high, exactly in this tormented 17th century., but serving as a polemic starting point for the constitution of modern scientific thought and of its fundamental constructs.

About the magic-symbolic elements in the musical environment

"Qui Rosarium intrare conatur Philosophicum absque clave, assimilatur homini ambulare volenti absque pedibus" (Michael Maier, *Atalanta fugiens*, Oppenheim 1618, EMBLEMA XXVII. De secretis Natura.)

If the study of "musical magic" in a closer sense, although restricted both geographically and chronologically to Europe in the 16th and 17th centuries, may result absolutely tangential compared to the artistic and cultural achievements of this period, it is nevertheless legitimate—both historically and methodologically—to conduct a research of the "fall-back" of this phenomenon on Knowledge and Power, on the use of a "musical" formalization in fields that are obviously extraneous to it. This is an extended and fertile area if seen from the point of view of the "fall-back" of the magic-symbolic thought on the official, victorious high culture, with all the consequent polemics, defenses of positions, and fructiferous critical reflections.

This is an influence also involving subtle mechanisms of communication, creating opinions and disposing the Intelligentsia of the 16th century to extremely differentiated attitudes, positive, negative, or doubtfully ambiguous, but always interesting and emblematic of the ferments and debates on methodological and gnoseological problems present in the culture of the period.

It is here that the musical "grid" acquires extraordinary importance, starting from the interdisciplinary literature hearing a musical stamp that was to be so much fashionable throughout the 17th century.

For what concerns this specific topic, especially the inherent relations between musical theory, philosophy, theology and the new science, I cannot but point out the rich bibliography in English and some Italian studies focussing on some of the nodes connecting the history of scientific thought and the history of mentality to the environment of musical speculation and the mytho-poetical possibilities of music, utilized both as a clue for the formalization of

magic-symbolic universes and—inverted—for a methodological (and ethical) dismantling of these rational models.¹

Often, and in very attentive and documented ways, this magic-symbolic aspect is treated by music—as mentioned—and always with truly interesting results.

In fact, music has always invested an eminently metaphysical value in the course of the history of humanity. The idea that a dogma, a truth, might find its realization in the musical paradigm in terms of human intellect, that a truth, in fact—as Schneider affirms—"must sing", constitutes a fundamental feature of antique thought.

"The equation 'song = musical harmony = harmony of the elements of Nature = concordance of ideas = order and truth ...', in reality forms a very logical chain of mystical thought."²

For Sun Ts'ien, the Chinese historian of the late 2nd century BC, music connects the Earth and the Sky:

"... the rites and music manifest the nature of Sky and Earth; they penetrate into the virtues of super-natural beings; they make the spirits descend that are high above, and they allow the ones down low to move upwards."³

Beyond doubt, even in the earliest periods, the fundamental idea of the mystical power of a sound or an instrument was confirmed: among the many possible examples it will suffice to recall the biblical narration of the conquest of Jericho (Joshua VI, 2–16 and 20).

What needs to be investigated is, how the sound or the mechanism of production connected to it might influence the natural or supernatural.

Data is scarce on this matter, unless we want to recur—once again—to the albeit vague conception of a Harmony of the World.

But let's proceed gradually.

We remember that the mythical musical magician (of a heathen mythology, but above all of a Christianized one) is Orpheus. His Jewish-Christian "copy" is constituted—both explicitly and implicitly—by King David, as by the way many tractates of musical theory confirm: "... it is no fable, but truest History"—Agostino Steffani writes in 1695—"that Orpheus enchanted the Beasts with his Song".

Orpheus, the representative of Music par excellence, Orpheus, whose myth is the basis of the drama in music, reveals the enchanting qualities of this art, his omnipotence over the things of this world, his capacity to act on the "naturalia", as dozens of musical tractates propose. The same Orpheus is quoted by Marsilius Ficinus (1433–1499) from the point of view of a connection between the Corpus Hermeticum and the Neoplatonism of the Renaissance: From Hermes Trismegistos, contemporary of Moses, to Pythagoras, from Plato to Plotinus, from the neoplatonic mysticism to the magic of nature:

"He [Hermes Trismegistos] is said to be the first author of theology, he was succeeded by Orpheus, the second theologian of Antiquity, Aglaophemus—initiated into the sacred rites by Orpheus—had Pythagoras as his successor in theology, of whom Philolaos was a scholar, the teacher of our godly Plato."⁴

The mythos of Orpheus, anyhow, brings us back to a fully Renaissance conception (or at least a conception enjoying new life in the Renaissance): the idea of Harmony, perhaps the greatest

among the esoterical contaminations of Music. Greatest, because it is common to all civilizations, to all beliefs, to all times. Harmony, reassuring but not comforting, is thus the basis of the possibility that Music may become the Speculum. Dei et Mundi.

If Chaos qualifies as the insertion of the Demonic into the spheres of human experience, or as the formalization of the Real on a rational level, as disorder; then its contrary, the generating act that presents itself as Being, as the presence in becoming, as construction, is Harmony.

The irrational that comes to penetrate into human reality, determining its nullification through the loss of sense (which impedes an intellectual linkage between Man and God), is the demonic showing itself in its opus of contamination. Thence, we find ourselves in front of an ambiguous reality, corrupting because corrupted, or else not integer, not harmonical, tempting.

Within the history of musical thought, this relation is structured as confrontation between the generation and the corruption actuated through the number, the (positive) conspiracy of the differentiated—which is not the One—that generates the Harmony of the World by modelling itself as "ratio" (yes, intellect, but also—similar to its Greek equivalent "logos"—a numerical relation).

As the Supreme Order, the Spirit of the World, the Music for the antiques is the Voice of God, the image of the cosmic creation and of its orderly organization; thence, harmony will be "Stimmung" (a), assuming a metaphorical-allegorical significance.

There are many proofs of the particular significance attributed to the term "Harmony" and subsequently to the particular consideration of music, the discipline of disciplines, a borderline territory open to subsequent exchange, topical area of ambiguity and of a magical "secum-ducere".

Music can (in the sense of "has the power to") reconstruct Nature, as it does not need to presume a nature to which to refer; music adapts itself easily to an "alchemical" use of the re-founding of the order of the world through a scheme of a cosmological order. It may be a constituting matter of both a macrocosmic and a microcosmic model.

Of the European Intelligentsia, of musical "Magic" and of the Fluddian polemics on the threshold of the 17th century

Nihil igitur aliud sunt motus coelorum quam perennis quidam concentus (rationalis non vocalis) per dissonantes tensiones ...

(Johannes Kepler, Harmonices Mundi Libri V, Linz 1619, S. 212)

Omnibus igitur in unum conspectum coactis, concinisi rectè, di-
 missis veris itineribus Planetarum per astrum ætherium, oportere nos
 oculos convertere ad Apparentes arenas diurnos, & apparentes quidem
 omnes ex uno certo & insigni Mundi loco, scilicet ex ipso corpore So-
 laris, fonte Motus omnium Planetarum videndumque, non quàm af-
 tus à Sole sit Planetarum quilibet, nec per quantum spaciū in unâ diè
 trajiciat hoc enim ratiocinativum est & astroonomicum non insinui-
 bile: sed quantum angulum in ipso solis corpore diurnus cujusque mo-
 tus subtradat, vel quantum arcum sub uno communi circulo, ex Sole
 descripto, qualis est Ecliptica, quolibet diè conficere videatur: ut ita
 hæc apparentiâ, beneficio luminis ad corpus Solis perlatâ, cum ipso lu-
 mine rectè in creaturas, in finibus hujus participet, sic influere possit:
 sicut libeo quarto. sibi ma coeli in forum, beneficio radiorum diurnis
 influere.

Docet igitur Astroonomia Tychonica, (remotis à planetario motu
 proprio, parallelibus orbis annui, quæ speciem ipsi induit stationum
 & retrogradationum) motus diurnos Planetarum in suis orbitis (app-
 arentes videlicet spectantibus ex Sole) esse hõc.

Marsus Lineari		Apparentis diurni	diurni	Marsus diurni	diurni
Lineæ	Lineæ	Peri.	Peri.	Peri.	Peri.
a 7	b 1	1. 40. a.	Inter 1. 47	4. Tertia	5. major.
d 3	e 2	2. 5. b.	& 2. 15.	et 5.	
c 8	d 1	3. 30. c.	Inter 4. 17.	5. Tertia	6. mar.
f 1	e 5	4. 30. d.	& 5. 50.	et 6.	
e 5	f 2	5. 14. e.	Inter 5. 17.	6. Diapente	7.
h 12	g 3	6. 1. f.	& 6. 1.	et 7.	
g 5	h 7	Tel. 17. 1. g.	Inter 17. 21.	7. Semitonii	8.
k 5	l 3	Perihelii 61. 12. h.	& 61. 18.	et 8.	
i 1	k 5	1. 94. 10. i.	Inter 94. 10.	8. Diapente	9.
m 4	l 5	Perihelii 97. 37. k.	& 98. 47.	et 9.	
		2. 144. o. l.	Inter 144. o.	9. Diapason.	10.
		Perihelii 334. o. m.	& 334. o.	et 10.	12. minore

Nota, quòd Mercurij magna Eccentricitas, faciat motum pro-
 portionem nonnihil differre à duplicatâ distantiarum proportione.
 Nam si scieris, ut 100, mediocrem distantiam, ad 111. Aphelium, duplo
 tantam proportionem motus Aphelii, ad motum medium 145 m. 32 f.
 tantæ prodiæ motus Aphelii 167, & si, ut 100 ad 99, distantiam perihelii
 & duplo tantam proportionem motus perihelii ad mediocrem su-
 undem: Perihelii motus fiet 591. utriusque major, quam hic posui:
 quia scilicet medius motus in Anomalia mediâ valde ex obliquo in-
 spectus, non apparet tantus, sc. non 145 m. 32 f., sed minor, circiter 51.
 Europa-

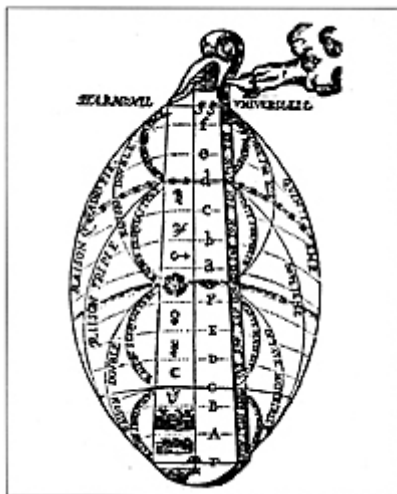
The Europe of the first third of the 17th century sees—as we all know—the blossoming of all kinds of writings, tractates, manifests, and consequent polemics around symbolist utopias, the cabbala, the secret societies of Rosicrucian types. This is—as I want to underline—a conspicuous final strike of the mathematicizing project of the Renaissance, configuring itself persistently as a "Strong Thought", in a moment when we hear the first feeble utterances of the modern scientific method, of a thought that—still—is but a "Weak Thought", free from any pretension to include within itself the whole of Nature and the Cosmos.

A part of the polemics and the subsequent clearing of a new methodological line is played—as we already pointed out—within or throughout the musical environment. By the way, one should not forget that Descartes himself works out a "Breviary of Music" in 1618 in which he hints at the "Method". And so we will find reference to music in more or less profound ways in the major script of Robert Fludd, Marin Mersenne, Johannes Kepler, Michael Maier, Petrus Gassendi, Athanasius Kircher, just to name a few.

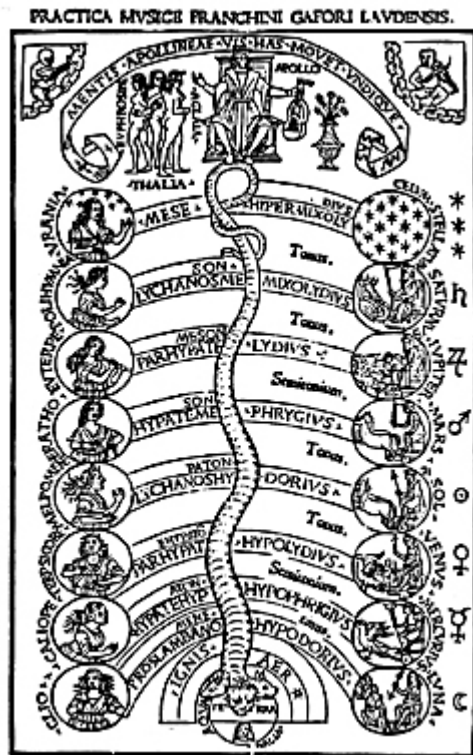
et liquet differentiam castitatis esse, & merum finem esse reliquas correspondere...
et quodam modo non potest, ut in vasis harmoniam, vel Musici perita per arithmetica...

Table with 10 columns (I-X) and 10 rows (I-X). Each cell contains a zodiac sign and a list of names. Column headers: I, II, III, IV, V, VI, VII, VIII, IX, X. Row headers: I, II, III, IV, V, VI, VII, VIII, IX, X. The table is titled 'Harmonia Musici Symphonicae, seu Emulationis animi naturae Symphoniam exhibens.'

A. Kircher: Musurgia Universalis, Roma 1650



M. Mersenne: Harmonie Universelle, Paris 1636-37



F. Gaffurius: *Practica Musicae*, Milano 1496

But as the musical topic presents itself as fertile ground for encounters and replications, its intrinsic elasticity allows for a utilization in various ways and with indeed very diverse goals and results. On the other hand, the intellectuals of the early 17th century do not always display a strict consequence of the "progressive" kind.

Marsilius, Pico della Mirandola, Agrippa, Gerolamo Cardano, Johannes Reuchlin, Trithemius, Giordano Bruno, Paracelsus, Campanella and Kepler believed one might—Starting from the arcane Egyptian-Jewish wisdom—force the angels to modify the motion of the celestial spheres and their influence upon the Earth. Their means were doubtless more refined than these of the sorcerers and witches of their time: Astrology, the cabala, the art of memorizing, the theory of sympathy, the mystics of words and gestures, the precious talisman and the alchemic furnace are very different from the vile techniques of the sorcerer, from the chaotic Witches Sabbath, from the magical or evocative formulas, but the cultural sign and tone are the same. just like the magician of the Renaissance they are searching—be it in Rudolf the Second's Prague, be it in Frederick the Fifth's Palatinate—for a possibility to flee from natural determinism, to dominate the asters, to associate with the demiurgical sphere.

Obviously, not all the intellectuals are so reconciling towards the utopia, or worse, towards "magic": The attack against Renaissance magic and simultaneously against the so-called neoplatonism with its animistic philosophies of nature was launched in France exactly at the beginning of the 17th century by Marin Mersenne.

One cannot deny, though, that in musical terms, the scientific revolution is a child of both the enthusiasm of the neoplatonians and the strict methods of Aristotelism.

Prior to their dissolution, giving way to the scientific revolution and to the cultural route adopted by the latter, the two classical Schools leave a precious heredity: Aristotelism (especially in its Paduan version) was to shape the minds of the fathers of the new science to a methodical strictness and epistemological correctness; Neoplatonism would deliver new goals rather than new tools. The great magic-astrologic utopia, connected to the values of Hermetics and neoplatonism, would indeed search to indicate those liberating instruments that would—

after the scientific revolution—be demanded from the new science. Often in history, the importance of the scopes and of the instruments becomes balanced: The quality of the one is interactively connected to the reliability of the other.

It was Mersenne himself to sustain that science—understood as the conversion of Man towards the creatures—is an instrument of salvation in terms of elevation, of the liberation of Man from his material needs in favour of those of the spirit(b).

"Liberation from the evil and needs, from myths and from fear, instrument of the power of Man over Nature (on a pragmatism as well as poetical level), tangible sign of Man's superior dignity compared to the rest of the creation, principal itinerary to force the human destiny towards the line of elevation able to transcend the bounds with the traditional shape—these are some of the functions modern science pretends to attribute to itself—They all resemble in an impressing manner the goals the magic-astrological tradition had imposed on itself in the first place."⁵

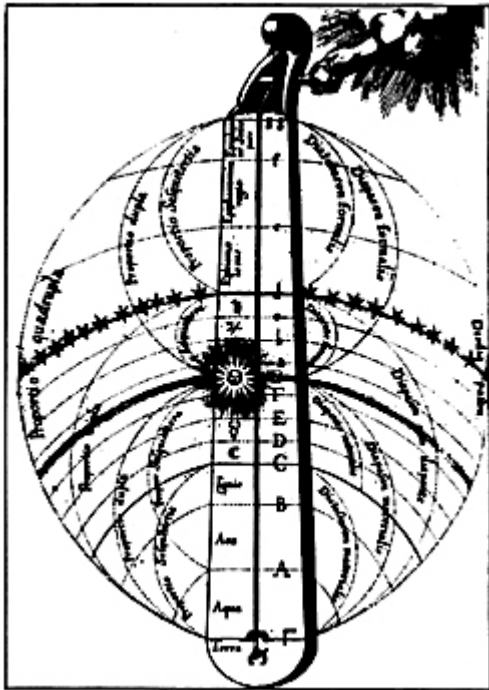
And it is the sign of a utopia that seems to be distinctive of that era in various aspects.

Today, as we are no more disposed to attribute to the Rosicrucians, to the Hermetics, or to the magicians of nature more than they are really entitled to (definitely not the paternity of the scientific revolution, but for certain the liberating idea of science), we must nevertheless make a balance of the connections that were established between the real fathers of the scientific revolution, and Renaissance magic. And these connections were also—if not mostly—harmonical-musical links.

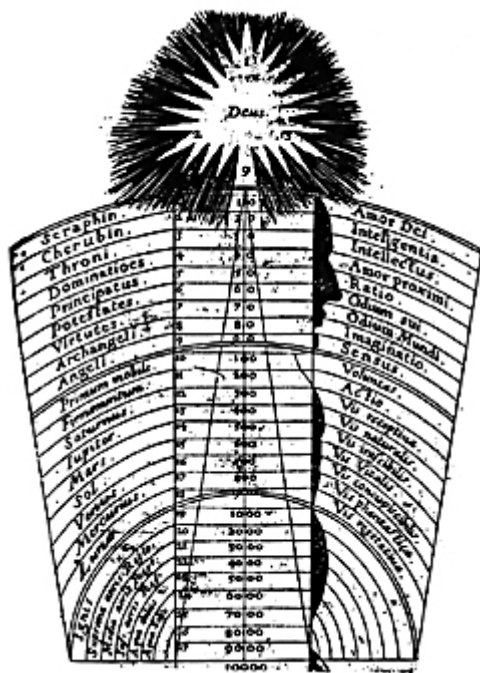
Usually, the mysteriosophical, magical, and astrological ideas of these scientists have been considered the "residual slags of Hermetics and Esoterica" and one got rid of that matter by the summary and simplifying declaration that in the moment of an evolutionary passage from one cultural species to another, there is always some aspect of the former left. Upon doing this., one forgets that the construction of a scientific theory is one matter, but conveying sense to these theoretical results is another. And it is beyond doubt that the magical-astrological residue does not influence the constructions of scientific theory in a theoretical sense, for it is not left to science to attribute a value to its proper results.

"That of the hermetic magic"—P. A. Rossi affirms—"is a dream, and like all dreams it is perfect in its unreality. So, why should one deny this dream its influence on the historical reality?"

... also the shadows paint the image of progress with light."⁶



Il Monocordo del Mondo (R. Fludd, *Utriusque cosmi ... historia*, Oppenheim 1617–21, Tractatus I (1617))



R. Fludd: *Supernaturali ... historia*, Oppenheim 1619

Marin Mersenne (1588–1648), of the order of the Minorites, founder of mechanicism, friend and mentor of René Descartes, rejected the animism of the Oxonian physician and Rosicrucian Robert Fludd (1574–1637): He admits to be true, the influence of music on the mind (from here his moral attitude towards music emerges), but he adverts not to search any magical effect in it. For Mersenne, sound corresponds to a vibration audible to the human ear, it is a "movement sonore", nothing else. Robert Lenoble wrote about this matter:

"... this movement sets in vibration the auditory organs and the nerves: there we find the cause of the phenomenon. Thus, in order to keep magic under control, he already orients himself towards a mechanistic psychology and science."⁷

Mersenne himself had his prerequisites clear and at hand as early as 1623 in his "Quaestiones in Genesim":

"Itaque, cum sonus sit veluti sonans motus, et motus tantam vim in omnibus rebus corporeis habeat, non est, quod miremur, si musica vires suas exerat, et huc illuc animam transferat"⁸

The "Quaestiones in Genesim" represent somewhat the "summa" of Mersenne's scientific interests, of his musical, mathematical, physical, and astronomical studies and contemporarily, the first structured attack against the magic-symbolic-astrological tradition:

"Sunt qui ad Platonis ideas recurrant, quae presint lapidibus, adeout quilibet suam habet ideam, a qua vim et energiam suam accipat"; "vel cum Hermete, et Astronomis ad stellas, et imagines coeli (recurrant)"⁹

Here the magical nucleus of Ficinian Platonism is denuded, the operational confusion between ideas, magical images and Hermetics. To Mersenne, the attribution of similar powers to similar images is simply a folly:

"Verum nemo sanae mentis dixerit illas imagines vim habere, ut constellationes magis influant"¹⁰

He condemns the doctrine of an "anima mundi", or at least the extravagant deformation of the latter, as introduced by Renaissance naturalists, the Cabbalists, and the Hermetics of the past, and he expresses himself in still more disparaging terms towards his contemporary Robert Fludd. These ideas were to be taken up again by Mersenne one decade later, and ulteriorly developed.

He adverts the students not to get caught up in analogies of language or theoretical-musical "notation", which is Fludd's custom: Finding comparable numbers in music and astronomy, does not constitute a sufficient reason to invariably imagine relations of causality.

"Verum omnes Musicos advertere velim non ita inhaerendum esse numeris, ut statim rem eo modo se habere credant, quo numeros esse viderint, quippe qui nihil ad vim musicae faciunt, sed tantum ut res prius inventae facilius concipiantur, et exprimatur"¹¹

The symbols are but symbols. Mersenne does not speculate about symbolic-magical explanations, not even in the practical musical universe, as Kepler does. The latter calls the interval of the major third "male", because it is related to the figure of the pentagon which has odd angles and is therefore—according to Pythagoras—male; the minor third, on the other hand, is called "female" for being related to the dodecagon (even angles and—according to Pythagoras—female).

"But I," Mersenne says concisely:

"... do not believe that the consonances derive from the figures, and therefore I do not stop at these symbolical relations and these analogies."¹²

The perfect music will be revealed to us only in Heaven.

"Mersenne never abandons the idea of a moralizing music, he, in fact, demands that the mechanistic science realize it, and—in any case—he perfectly understood that the real way of serving God is not to subtilize upon pseudomystical analogies, but to construct a serious science"¹³

The method of the Cabbala that we find with all the Hermetics, is based upon the doctrine of the universal correspondence of matters, and especially of the human Microcosm, body, and mind, with the Macrocosm, the great Universe. Mersenne abused these analogies occasionally (see, for example "La Verité des Sciences" and "Quaestiones in Genesim"), but he had enough sense to consider them just literary ornaments, and he energetically contested those who wanted to create the principles of scientific research from playing with words: He saw the Cabbalists—to use the diction of Lenoble—as a kind of Crossword-puzzle-solvers' Club thinking to be the Academy of Science. Fludd, for instance, wanted to find the principles of medicine and astrology in the Cabbala; the asters, the elements, the parts of the body, as much as they are a number and a letter of the Hebrew alphabet, they are also a note of the scale. Consequently, the combination and location of the bodies in nature does not only reflect the harmonical proportions of musical intervals, but there can be found and proved a "universal", a macrocosmic reality, as well.

Mersenne is far from rejecting a priori the hypothesis of a harmony of Spheres, which he finds equally supported by whom he considers to be a valid mathematician, namely, Kepler. He does examine it especially in his "Traité de l'Harmonie Universelle", of which many chapters are a point-by-point rejection of Fludd's laborious "Microcosmos" (the "Utriusque Cosmi Metaphysica, Physica, et Technica historia", 1617), because the hypothesis does not account for the data of observation. In accordance with Kepler on this point, he retains in fact that the astrologic-musical symbolism cannot achieve confirmation other than by the astronomers' and physicists' calculations. However, these calculations are completely disregarded by Fludd. Substantially, he presents himself rather as a dim candle than a great luminary of science (wrong calculations and valuations of the distances between the planets and the Earth, of the properties of vibrating chords, of the density of the air, of chemical compositions etc.).

Thus his music and his cabbalistic astrology remain purely arbitrary. And here is the judgement of Reason on the Cabbala: The latter always confirms but proves nothing.

Mersenne lets himself go for some cabbalistic plays only to be able to demonstrate their unfoundedness; all the affirmations of the Cabbala are "frivola, fabulosa, vel saltem absque fundamento prolata"¹⁴

But this play is not always innocent. It may lead to distorted analyses, to a position against divine laws:

"Sane demiror eorum (Cabbalists) solertiam, qui ex qualibet dictione aequè possunt insurgere, ut adversus Scripturam sacram, et legem divinam quaecumque dicant, at ut pro ea dimicent ..."¹⁵. These "Dreams" are worse than ignorance, for they impede us to observe nature correctly. As he underlines in reference to Fludd's pretension of instructing us about the Harmony of the World:

"It would be a lot better not to know that Harmony at all, than to imagine it other than It is."¹⁶

The polemics between Mersenne and Fludd in which Pierre Gassendi, supporting the "bon père", also interfered, went on for quite some time and with sometimes outrageous tones from both sides. The "victory" of Mersenne took shape—but then in a truly dismantling manner—when the public became aware of the results of the criticism of Isaac Casaubon on the "Corpus Hermeticum" of Trismegistos (1614), which the latter said to be dated back in the first centuries AD; Casaubon revealed the falsity of the "Egyptian" tradition and indirectly caused a serious crisis for all the Hermetics, Cabbalists, and alchemists of the Pico-Ficinian genre (although it took years fore the results of his textual criticism to be at least partially recognized and accepted).

Mersenne did not let this opportunity escape him, and in a letter to Nicolas de Baugy, Ambassador of France to the United Provinces, dated April 26, 1630, in which he sent his friend the anti-fluddian text by Gassendi, he wrote:

"Cum autem Fluddus plures alios autores enumeret, illos solo affero, quorum autoritate in suis libris nititur. Quos inter primum ordinem obtinet pseudo-Trismegistus, cujus Pimandrum et alios tractatus Scripturae sacrae auctoritati atque veritati pares efficere videtur, et de quorum aestimatione nonnihil, credo remittet, si legat Casaubonum,, prima ad apparatus Annaniam Exercitatione".

And the beating went on: The Cabbalists deceive us about the nature of language, Mersenne continuously confirmed. For them, the word means the essence of matter. Mersenne discussed and carried on the polemics for a long while. But it is the new science, it is the mechanicism from which he demanded the decisive response—as Lenoble pointed out—in order to destroy the secular prestige of the "onomantia": The word is nothing but a "flatus vocis", simply a conventional sign, a vibration of the air, the nature of which is fully discerned and disclosed by physiology and acoustics. Only true science frees from false science.

And only the former allows the Morale to be salvaged. For—and this is the supreme danger of the Cabbala—in the universal correspondence it supposes between names, asters, natural elements and physical persons, the human destiny is nothing more than a single element of cosmic history.

"Mersenne's Music is Paracelsus' Medicine, that is, the panacea of all evils of the mind and the body", Lenoble points out.¹⁷

Mersenne fought the illusions of astrology and of the musical Cabbala of Fludd, and with the same idea of Universal Harmony—the title of one of his most famous tractates—he designed a providential correspondence of the proportions in all parts of nature. An element that is not at all brought into the game by the English physician:

"His igitur cognitio a mundi materia exordium sumamus quam chordae monochordi, cujus instrumentum magnus es ipse Macrocosmus [...]" ; "Concludimus igitur Solem naturae DEUM, sed creatum, virtute harmoniae spiritualis per Diapason formale cum intervallis suis proportionaliter ordinatum accipere omnem formalem et lucidam virtutem a DEO omnium maximo, supernaturali creatore increato; terram vero per Diapason materiale correspondem DEI influentias accipere; indeque habere eandem cum Sole correspondentiam [...] Haec itaque est machinae universalis harmonia naturalis, quam nemo hac tenus quod sciam, ita succinte atque dilucide explicavit: Istius modi autem monochordi mundani consonantiae hoc modo depingentur. [...]"¹⁸

Mersenne rejected the occultist vision of nature in favor of a substantially psycho-physiological perspective that wished to safeguard human freedom from magical predetermination at all costs, thus swaying the position of many of his "colleagues".

He renounces to formulate a metaphysical theory of the Harmony of the World which remains solely the secret of God. "As a Christian, he reserves for himself the way of grace"¹⁹

The topic of the animal machine, i.e. the topic of mechanicism as such, set forth exactly by Marin Mersenne, appears in the early 17th century within the sphere of gnoseology as an answer to the panpsychism of Renaissance naturalism, and as a proposal for a new theory of perception that would be able to distinguish between the automatism of sensation and the intentionality of perception on a strictly "operational" basis. This topic has been dear—in all its musical and acoustic argumentations—to all that occidental philosophical tradition from

Boetius onwards that has approached the problem of consciousness in organically dualistic terms.

At this point, we will surely meet some breaking points: along these, a clear line of demarcation is established between God and Man on one side, and Nature on the other, to express it with A. Espinas.

Also Johannes Kepler (1571–1630), when he did not give way to animistic thoughts, dryly fought his polemics with Fludd and the cabbalistic imposture in general. As soon as 1608, Kepler points out his position in a letter to J. Tanck:

"I, too, play with symbols and have ideated a work entitled 'Geometric Cabbala' [...]. But I play in such a way so as never to forget that this is just a game. Nothing, indeed, can be proved with symbols; no secret of Nature whatsoever is unveiled by geometric symbols. They only give us the results that were known beforehand, unless it is demonstrated with secure arguments that they be not only mere symbols, but that they express the way and the cause of the connections between the two matters compared."

In his "Appendix" to the "Harmonices Libri V" (quoted here according to the attentive Italian translation by professor Mario Fontana), a text dealing so much with musical theory in reference to astronomy, Kepler accurately points out the differences distinguishing him from Fludd:

"Therefore in his work there are numerous illustrations, in mine, on the contrary, there are mathematical diagrams composed with letters. You may well see how he enjoys himself in tenebrous enigmas of things, where I deeply try to bring to clarity in my intellect the matters wrapped in obscurity. The first is the familiar attitude of the alchemists, of the Hermetics, and of the followers of Paracelsus; the latter is characteristic of mathematicians."²⁰

Obviously the polemics that start to gain shape in the "Appendix" regards the conception of "Musica Mundana" by Fludd, taken from the "Utriusque Cosmi ... Historia".

Kepler proceeds as follows:

"And so also in books II and III, where he treats the same matters I do, there is the following difference between the two of us: for all the things he takes from antiquity, I shape from the nature of the matter as such and I treat them starting from the same basis: But while he usurps incorrect and confusing affirmations conveyed in an insecure manner, I proceed according to the natural order, until every matter stands correctly—according to the laws of nature, in order to avoid confusion; [...] In few words, for what concerns treating the Harmony, the one treats vocal and instrumental music, the other philosophical and mathematical music."²¹

And even greater is the "discrimen" for the astronomer in the moment when Fludd introduces the Music into the World:

"Let us now proceed to another step of this author, where he introduces the discourse about mundane music: Here, the difference between the two of us becomes nearly immeasurable. In the first place, all the harmonies he wants to prove, are pure symbolisms, of which I say the same thing I have said of the symbolisms, of Ptolemy: that they are rather poetical and oratorical than philosophical and mathematical."²²

And, coming to the core of the polemics: "But to get closer to the principles on the basis of which Robert Fludd constructs his mundane music, we will say that he first deals with the whole world and its three parts, Empirea, Celestis, and of the Elements: I, on the contrary,

keep strictly to the celestial, and not even to that as a whole, but only to the movements of the planets under the zodiac. He, trusting in the antiquies who believed that the power of harmony could derive from abstract numbers, he contents himself by demonstrating there be an accordance in whatever way he numerates them, without preoccupation about the way in which the units be conjunct in these numbers; [...]"²³

Remembering furthermore that Fludd had expressed himself in his criticism of Kepler in an ungentleman-like manner:

"The mathematicians of everyday occupy themselves with the shadows of numbers, the alchemists and the Hermetics embrace the real marrow of the natural bodies", as Kepler reports in his "Apologia adversus Rob. de Fluctibus" (1622), where—by the way—he does not spare his blows upon the English physician:

"In constitutione terminorum Harmoniae cuiusque descripsi, te fiam veteribus qui credebant via Harmonicam esse ex numeris abstractis" [...] "Kuno numerum ais formalem, vere igneum, arioni familiarissimum. Vide qua re conveniamus. Mihi mentis, et in ea quantitatum et circuli, tibi Naturae generatis opes praecedunt, quas sequitur utinque Numerus"; "Atque hino vel maxime demonstro, nullam doctrinae tuae iniuriam illatam a meis comparisonibus, dum eo meos Harmoniarum terminos appello mathematicos, tuos vero aenigmaticos, pictos Hermeticos."²⁴

And further:

"Tu rei figuram vel Hieroglyphicum effinxeris"; "Tuis picturis mea comparavi diagrammata; fassus librum meum non aeque atque tuum ornatum esse, nec futurum ad gustum lectoris cuiuslibet: Excusavi hunc defectum a professione, cum ego mathernaticus agam".²⁵

But the tendency towards a mystical-symbolical musicography, although in coordinates (from a phenomenological point-of-view) rigorously adhering to the "Roman" religious canon, is not completely extinguished: if ever, it is attenuated. It is catholicized, like in the Jesuit father Athanasius Kircher: But this is another story and leaves out the environment of the court of Rudolph II in Prague, and the thoughts of Maier (the one of "Atalanta fugiens" that interrelates music and alchemy) and of Fludd who agrees with them: Their works as published in the Palatinate of Frederick V. will meet a world that is rapidly changing and a Europe that is devastated by the Thirty Years' War.

The "Amphiteatrum sapientiae aeterne" of Khunrath, with the devotedly praying cabbalist-chemist and a group of musical instruments in the foreground is definitely extinguished. But this, too, is another story that would well merit an analytical work of its own ...

Savona. Summer 1990

Anmerkungen

¹ Vgl. unter anderem die Texte von Gozza und Leoni in der Bibliographie.

² Marius Schneider, *El origen de los animales—símbolos ...* 1984, zit. nach der ital. Ausgabe: *Gli animali simbolici ...* Mailand 1986, S. 122

³ Ebenda, S. 124

⁴ Marsilius Ficinus, *Opera Omnia*, Basel 1576, S. 1836, Argumentum a Cosimo de' Medici, im *Corpus Hermeticum*.

- ⁵ P. A. Rossi, "L'eclisse della ragione", vgl. Bibliographie, S. 109–110
- ⁶ P. A. Rossi, a.a.O., S. 111
- ⁷ Vgl. Robert Lenoble, *Mersenne ou la naissance du mécanisme*, Paris 1943, S. 367
- ⁸ Marin Mersenne, *Quaestiones in Genesim*, Paris 1623, Sp. 1164
- ⁹ Ebenda, Sp. 1565
- ¹⁰ Ebenda, Sp. 1561
- ¹¹ Ebenda, Sp. 1699a
- ¹² Derselbe, *Harmonie Universelle*, Paris 1636–37, *Traité des Consonance*, III. Buch, T. XVIII, S. 188
- ¹³ Robert Lenoble, a.a.O., S. 370, Anmerkung
- ¹⁴ Derselbe, *Quaestiones in Genesim*, Sp. 1705b
- ¹⁵ Ebenda, Sp. 704
- ¹⁶ Derselbe, *Traité ...*, S. 453
- ¹⁷ Robert Lenoble, a.a.O., S. 531
- ¹⁸ Robert Fludd, *Utriusque cosmi ...*, Oppenheim 1617, S. 85 und 88
- ¹⁹ Ebenda
- ²⁰ Johannes Kepler, *Harmonices Mundi libri V*, Linz 1619, "Appendix", S. 252
- ²¹ Ebenda
- ²² Ebenda, S. 253
- ²³ Ebenda
- ²⁴ Derselbe, *Apologia Adversum Demonstrationem Analyticam ...*, Frankfurt 1622, S. 33
- ²⁵ Ebenda, S. 5 und folgende

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