

# FROM MERSENNE TO RAMEAU: SOCIAL INNOVATION IN FRENCH SEVENTEENTH AND EIGHTEENTH CENTURY SOCIETY AND THE TRANSFORMATION OF THE CONCEPT OF “HARMONY”

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**Abstract:** In the theoretical works of Rameau’s predecessors we meet different concepts of “harmony” in relation to the practice of music of the Renaissance and Baroque. The concept of “harmony” in French music of the seventeenth and eighteenth centuries changes in accordance with the change of social relations and spiritual climate from rationalism to the Enlightenment: for Mersenne harmony is the “echo” of the universe; for Couperin the aristocrats’ “development path”; for Rameau a scientifically based theory of the nature of sound and the way in which music acts on man. The historicity of the term and the search for its interpretation require a much broader context than the musical. The interpretation of the concept of “harmony” in this paper strives for a social dimension, because its basis is a universalist idea. The topic is the origin, formation and review of historical meanings of the musical concept of “harmony”.

**Keywords:** universal harmony; perfection; excellence; resonance

## Introduction

The subject of this paper is the origin, formation and review of historical meanings of the musical concept of “harmony”. A musician with a classical education identifies “harmony” as the doctrine of chords, inversions of chords and the principles of chord progressions, established as “the science of musical harmony” by French composer Jean-Phillippe Rameau (1683–1764) in his *Treatise on Harmony Reduced to Natural Laws (Traité de L’Harmonie Reduite à les Principes naturels)* in 1722. In the theoretical works of Rameau’s predecessors we meet different concepts of “harmony” referring to the practice of music of the Renaissance and Baroque.<sup>1</sup> The historicity of the term and the search for its interpretation require a much broader context than the musical one. The interpretation of the concept of “harmony” in the work strives for a social dimension, because its basis is a universalist idea. To confirm this procedure we can refer to the approach of contemporary semiotician Jan Mukařovský (1891–1975): “to interpret the aesthetic object inevitably means weighing its participation in the aesthetic codes that govern collective consciousness” (Bann, 2004, 170);

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<sup>1</sup> The presence of the idea of “harmony” in the music of the Renaissance and Baroque is based on the ideas of the Florentine philosophers Marcilio Ficino (1433–1499) and Pico della Mirandola (1463–1494). In the “Book of the Sun” (*Liber de Sole*), under the influence of Neo-Platonists Plotinus, Porphyry and Proclus, Ficino constructs an elaborate superstructure of mysticism which has instigated a series of Orphic thesis and a reconstruction of the Pythagorean concept of “universal harmony” in the work of Pico della Mirandola (Tomlinson, 1988, 132).

or Jonathan Crary (1951): “the idea of the 'innocent eye' ... that was unheard of in the 17th and 18th centuries ... became possible only in the 19th century” (Bann, 2004, 171).

The idea of universalism in French culture was taken from Antiquity during the Renaissance and its presence is evident in various forms until the end of the period Enlightenment period. The French social system developed in the seventeenth and eighteenth centuries from authoritarian monarchy to bourgeois democracy. The spiritual climate in this period was formed under the influence of Descartes' rationalism, Pascal's melancholic idealism and Rousseau's humanistic thought. The basis of all the changes was the relationship to ancient thought and the desire for modernization. This paper starts from the idea of “harmony” in French music of the seventeenth century, “French classicism”, whose transformation is seen as a parallel emergence of the French musical style of the eighteenth century, “French taste”.

### **The social concept of “harmony”**

The concept of “harmony” appears in seventeenth century French culture as a result of the adoption of ideas about the role of music in human individual and social life. The initiator of these ideas was the enlightened, musical King Louis XIV (Louis XIV of France, 1638–1715). The basic idea of this absolutist ruler was a vision of a state based on “divine justice”. Christianity had adopted the belief that “justice” is immanent to the “universe” from ancient philosophy.<sup>2</sup> Louis XIV found his inspiration for the formation of an absolute monarchy in Plato's concept of the “ideal state”, the democratic community of Greek city-states. In such a state, poets and musicians occupied an appropriate place. Plato derived his vision of “harmony” and ideas about the role of music from the early Greek philosophers<sup>3</sup> characterized by reciprocity in the understanding of society and the cosmos. Among them was the prominent mathematician, philosopher and mystic Pythagoras. Plato adopted Pythagorean beliefs about the nature and man, and in *Timaeus*, or *On Nature*, a naturalistic interpretation of nature (cosmos is “harmony”, universe is “unity”) joins the mystical Orphic meaning “perfection”, “beauty”. Plato assigned the role of “bearers of cosmic knowledge” to

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<sup>2</sup> This point was clearly expressed by pre-Socratic philosopher Anaximander of Miletus: „That from which things arise by necessity perish therein, because they, according to the decision of time, pay each other just punishment and retribution for their injustice” (Jeger, 2007).

<sup>3</sup> For the Presocratics “Harmony” was: Nomos - divine law of unity (Parmenides); Logos - the essence of beings, tension (Heraclitus); the Philia - Neikos relationship, a relationship of love and feud (Empedocles); Katharmoi - path of truth (Orphic pietism, Pythagoras); SPHAIROS - round, rest, shelter harmony (eschatological beliefs of the Orphics); or spiritual arrangement of humanity (Prodike) (Jeger, 2007).

the poets.<sup>4</sup> In the *Philebus* Plato defines harmony as an order of goods, a supreme “Good” is understood as the coexistence of unity and plurality, whose symbol is the tetrad (in music this would be the symbol equated with the tetrachord). The individual characters of the Greek nation (the Ionians, Dorians, etc.) were reflected in the application of appropriate musical modes, which represented their musical style, their unique “harmony”. The coexistence of nations, the “ideal state” according to Plato's ideas, involves the coexistence of musical modes.<sup>5</sup>

### **Mersenne: “universal harmony”**

The spiritual values of the seventeenth century French culture are rooted in the rationalist<sup>6</sup> philosophy of René Descartes, (lat. Renatus Cartesius, 1596–1650). Mathematician and philosopher, Descartes can be considered the godfather of the scientific revolution and the founder of anthropocentrism and subjectivism. In his *Principles of Philosophy*, he puts forward the concept that the philosophy is study of wisdom, which should manage human activities, life, health and the arts. Descartes contributed to the acceptance of ancient thought in French culture through the liberation of the human mind from the religious revelation. In his early *Compendium Musicae* from 1618 he discusses the theory and aesthetics of music. His view of the universe and the human affects and passions is mechanistic.

Descartes' student Marin Mersenne<sup>7</sup> established the concept of “harmony” in the French music of the seventeenth century. Mersenne built his theory on Kepler's views as set out in *De harmonica mundi*, which regards harmony as a relationship, and music as a model for interpreting the world. The meaning of Mersenne's concept can be deduced from the title of

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<sup>4</sup> It is often argued that Plato's idea is that poets should be expelled from the country as in chapter X of *The Republic*; however in his *Timaeus* Plato understood poets as creators who transferred knowledge from the conceptual to the physical plane through metaphors, and introduced the concept of “cosmic correspondences” for the conceptual-physical relationship.

<sup>5</sup> Each tribe in ancient Greece had a different “harmony” by which Plato implies musical style: Ionians were soft, Dorians strict, Phrygians passionate, poignant. Considering the notion of “good and bad music” Plato analyzes the modes that were in use: hypo-Doric and hypo-Lydian modes cause pain and he did not recommend them, The Ionian and Lydian are debilitating and relaxing, while the Lydian leads to lasciviousness. Plato recommended the Doric and Phrygian style, first masculine, serious and magnificent, for a man of war, and the gentle Phrygian Peace, appeals to the gods, without pride, intelligent and humble.

<sup>6</sup> The rationalist French culture did not readily accept the doctrine of Renaissance mysticism. The French Renaissance medical doctor and occultist Symphorien Champier (1471–1538), author of *Concordia discors, e pluribus unum* (Heninger, 1974, 153), was the subject of ridicule in Rabelais's *Gargantua and Pantagruel*.

<sup>7</sup> Marin Mersenne (Marin Mersennus or le Père Mersenne, 1588–1648), a member of the Order of the Friars Minor educated within the Jesuit order. He studied mathematics and music with such greats as Descartes and Pascal Etienne, and worked with the leading scientists of his time in Italy (Giovanni Battista Doni, c.1593–1647; Galileo di Vincenzo Bonaiuti de' Galilei, (1564–1642), the Netherlands (Constantijn Huygens, 1596–1687) and England.

his work *Harmonie vniverselle, contenant la theorie et la pratique de la Mvsique, Ou il est traite de la Nature des Sons, & des Mouuemens, des Consonances, des Dissonances, des Genres, des Modes, de la Composition, de la Voix, des Chants, & de toutes sortes d'Instrumens Harmoniques* published in 1636: harmony is at one and the same time musical theory and practice, knowledge about the nature of sound and rhythm, consonance, dissonance, genres, modes, composition, voices, singing and all kinds of harmonic instruments. Mersenne's mathematical and musical research represents a continuation of the Pythagorean calculation of consonance, the formation of the modes and attempts to solve the problem of temperament. The problem of temperament<sup>8</sup> is the question of the possibility of coexistence of natural modes in the 12 note scale. At the end of the Renaissance music theorists proposed an equal temperament of a 12 note scale<sup>9</sup>, but in practice, this solution was not accepted. Equal temperament is artificial, because the voice, brass and string instruments spontaneously tend to produce pure, natural intervals. For Mersenne, as well as the majority of baroque composers, equal temperament means a loss of infinity, reducing all modes to the same color.

Mersenne also discusses various problems of interpretation. He interprets the heavenly "harmony of the spheres" and its reflection in the proportions of the harmonious tones of the monochord as the basis of the mysterious power that music has in the human microcosm. Mersenne talks about the utilitarian power of harmony (*utilite de l'harmonie*) referring to the

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<sup>8</sup> In accordance with the meaning of the term in Latin, "temperament" is the balance of elements in the mix. The main problem we face when fixing "temperament" is the impossibility of tuning intervals in the 12 tone scale so that each one is pure. The interval can be represented by the ratio of frequencies of two pitches. The octave has a ratio of 1: 2, the fifth 2:3, the fourth 3: 4 and so on. Three consecutive pure major thirds  $(5:4)^3=125:54$  are less than an octave (128:64), the difference is called diesis; furthermore, four fifths are not identical to the range of two octaves and a third. The difference is known as the syntonic comma; it was similarly demonstrated that twelve consecutive fifths form a wider interval of 7 octaves, and the difference is called the Pythagorean comma. Pure thirds and perfect fifth have opposite tendencies which mean it is impossible to achieve "pure temperament" or a tuning of pure intervals within the octave. A compromise can be achieved in many ways: in the Middle Ages the goal to produce as many perfect fifths as possible, so Pythagorean temperament was used; in the Renaissance pure thirds were favoured, and Meantone temperament was used; Baroque composers used various modifications of Meantone, with the aim of producing the best triad, in the tonalities with the least signs in the key signature. The consequence of unequal temperament is a different character of modes and tonalities to varying degrees; in equal temperament there is no pure intervals within the octave (all fifths are equally narrow, all thirds are equally widened, each semitone is increased by the twelfth part of the Pythagorean comma) and although it was devised quite early, it has been in practical use only since the nineteenth century.

<sup>9</sup> One of the earliest discussions of equal temperament comes from Aristoxene's writings from the 4th century BC. Two theorists who simultaneously but independently of one another found the closest solution to equal temperament were Zhu Zaiyu (Zhu Zaiyu, 1536–1611) 1584 and Simon Stevin (Simon Stevin, 1548–1620) 1585 (the twelfth root of 2 appears first in the West in his *Van De Spiegheling der singconst* (1605). Equal temperament was not only difficult to calculate, but also to produce, all solutions are only approximations. The Italian musicians and theorists Zarlino (Giuseffo Zarlino, 1517–1590) and Vincenzo Galilei (Vincenzo Galilei, ca. 1520–1591), father of Galileo Galilei, first advocated the introduction of equal temperament in the Renaissance. One generation later Mersenne presented several possible temperaments of harmonic instruments.

notion of the Tertullian *modulabantur Christum* and identifying Orpheus with Christ (Magnard, 2011, 34). He sees the tetrachord as a musical metaphor of four characters (*humeurs*) and thus equates harmony with timbre. He argued with Zarlino (Giuseffo Zarlino, 1517–1590) and V. Galilei (Vincenzo Galilei, ca. 1520–1591) in an attempt to convert the expression to the meaning. Mersenne reveals the way in which the meaning is concealed in the expression: “it is only an echo” in this sense is closer to Augustine than Descartes. Mersenne formed a concept of pleasure (fr. *plaisir*): Music is a language, it expresses a sense, embodies the spirit, its meaning is transmitted thanks to the pleasure caused. Mersenne followed anthropocentric ideas and established the primacy of art over science, gave primacy to man understanding the harmony of the spheres: harmony is universal, but man is its measure. Mersenne’s universalistic concept of “harmony” suited the absolutist monarchy of Louis XIV, its strict order and hierarchy of subjects: for Louis XIV the absolutist state was the totality of the order of professions, activities and individuals within it, and so the “harmony” of Mersenne is the unity and order of modes, rhythms and timbres. The music of Lully (Jean-Baptiste Lully or Giovanni Battista Lulli, 1632–1687) reflects French classicism in the best light and represents a realization of Descartes and Mersenne’s ideas, as well as a demonstration of absolutism of Louis XIV. Lully’s opera themes, magnificent orchestra and the pompous character of the music played a key role in the performance of “universal harmony” in the court of the Sun King.<sup>10</sup>

### **Change from classicism to the aesthetics of feelings**

The music of the Baroque period is characterized by the opposition of the French and Italian style. The Italian baroque, in accordance with the ideas of the counter-Reformation, adopted mysticism<sup>11</sup>, while the French style had a different path of development, restricted to the rigor of Descartes’ Cartesian rationalism. During the seventeenth century Italian Baroque developed its basic characteristics (the transition from modality to tonality, expressiveness, chromatics, instrumental technique), while the French retained Renaissance practice (the music was mostly modal, vocal music was subordinate to the meter of speech, and

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<sup>10</sup> The festivities at the court of Louis XIV reflect the vision of the “harmony of the universe”: great balls were held at the Palais Royal, and their Pythagorean-Platonic basis is reflected in the carefully orchestrated geometric figures of the final *grand ballet* in which the representatives of the aristocracy and the King himself took part.

<sup>11</sup> In keeping with the spirit of the Counter-Reformation, representatives of the Italian style adopted Neo-platonic mystery. Existing during the Renaissance in the form of numerical symbolism, in the baroque it was spread as a theory of expression. The essence of Orphism (dogmatic pathos), which was adopted by the Neo-Platonists, was an individual experience of the divine, and an ecstasy (the passion of the soul) in which the experience of the divine was revealed in sanctification and mysteries.

instrumental music to dance meters)<sup>12</sup>. The transformation of the conservative French style would be possible only after fundamental ideological and spiritual changes.

Changes in the spiritual climate can already be sensed in Pascal's (Blaise Pascal, 1623–1662) philosophy. Published after his death, his *Thoughts (Pensées de M. Pascal sur la religion, at sur quelques autres sujets)* gained great popularity. Their fragmented structure announced the disappearance of the formalism of the previous epoch. Fragment 233 destroys the supremacy of reason over the powers of the heart: “If it is not possible to prove the existence of God, neither can it be proved that He is not”. The French philosopher Lucien Goldman (1913–1970) observed in Pascal's philosophy a tragic vision of the world, in which man finds himself in a universe somewhere between the infinitely large and the infinitely small, seeks the truth and finds uncertainty, seeks beauty and happiness and finds misery and death. Pascal, a melancholic idealist, reflects the spirit of change in the concept of “harmony” from the canon of proportions, separations and clarity, to a new ideal of “harmony” as a vision of the unity of atmosphere, color and individuality (Goldman, 1980).

Pascal's ideas were developed by Nicolas Malebranche (1638–1715) theologian, philosopher and physicist. The idea of God is central to his philosophy; according to him all ideas come from God and are universal. Malebranche was also intensively involved in physics, especially Newton's research in the field of optics. In *De la recherché de la vérité? Où l'on traite de la Nature de l'Esprit de l'homme, et de l'usage qu'il en doit faire pour éviter l'erreur dans les Sciences* which deals with man's perception, he introduced the concept of “sensation”: while ideas are geometric or mechanical properties of the body, “sensations” are man's experiences of color, quality or the integration of multiple properties. His attitude is the basis of a new approach to art: “harmony” as a mechanical reflection of the world gives way to the “harmony” as the perception of unity.

The ideas of the two philosophers were the driving force of change. Around 1688, there was a conflict of the “ancients and the moderns” (*Querelle des Ancienes et des Modernes*)<sup>13</sup>.

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<sup>12</sup> Although Mersenne admired the Italian style and advocated the art of diminution, *passaggi*, and the expression of affects, *esclamazione*, present in Caccini's *Le Nuove musiche* (Giulio Romano Caccini, 1551–1618), the masters of French courtly arias (airs de cour) nurtured the cult of unity of poetic meter with musical meter. François de Malherbe (1555–1628) established a “poetic vocabulary” and believed that anyone who abandoned it showed poor taste. The result was a narrowing of expression in both words and music. Refinement in ornamentation and a limited range of movement responded to the artificial atmosphere of the court nobility.

<sup>13</sup> Modernists deny the principles by which ancient culture can and should be a model for the construction of a modern society. The basis of their attitude change is ethical ideals, as the supreme goal they stress the freedom of individual life. The humanism of the ancients and moderns are based on different values: while the ancients glorify humility, heroism, and pomposity, the modern age sets the foreground confidence, ingeniousness, and the privacy of the individual. Changing attitudes towards mankind, the consciousness of man as an individual, imperfect being, led to the opposition of the individual and the universal.

The essence of the debate is the notion of individuality and its consequence, subjectivity of taste. The dominance of feelings provokes a state of uncertainty and instability: “If the Reason of the Classicists represents a universal criterion, emotion is through its essence sentenced to change” (Feri, 1994, 50). The emergence of a new social class, an intellectual elite, which thanks to its “excellence” could win an aristocratic title, launched the idea of an “aristocratic upbringing”. The term “virtue”, “perfection” (*arête*), is contained in the etymology of the word aristocrat; one way of achieving it was dealing with science and the arts, especially music as one of the *artes liberales* (skills worthy of a free man). The transformation of the spiritual climate and ideological changes resulted in the need for a “unification of taste” (Italian and French) in art. The initiators of the “unification of taste” were members of the French aristocracy which was strengthened and became independent during the late seventeenth century, the period of decline of the “Sun King”, the end of Louis XIV’s reign. The Jacobite court in exile played an important role in favoring Italian style, as did the court of the Regent Philip II of Orleans who opposed the tastes of Versailles (Fader, 2007).

### **Couperin: “harmony of *ordres*”**

Couperin (François Couperin, 1668–1733), known as Couperin the Great, was active during the reign of three kings: Louis XIV, the Regent Philip II of Orleans and Louis XV. Couperin was one of the major proponents of the union of French and Italian taste, next to his patron and teacher Marc-Antoine Charpentier (1643–1704). Charpentier introduces the concept of the “energy of the mode”, the characteristic atmosphere of sonorous material arising from the unequal temperament of harmonic instruments (Italians favored *mean tone* temperament, where the colors of different keys are extremely different). This energy was the integrating factor, a form of “harmony”, color, atmosphere, unique character and means of expression in music where modality has not yet changed to tonality.<sup>14</sup>

Couperin’s clearly stated goal of uniting taste (the title of a collection of chamber works *Les goûts réunis*) is present in his oeuvre for solo harpsichord, where it develops towards the construction of building a complex rational-artistic musical universe, a sort of encyclopedia of ideals and values. Couperin created a new type of suite for harpsichord, the Order (fr.

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<sup>14</sup> Charpentier explained the need for transposition of the modes: the first reason is the adjustment of different voices, others expressing various passions, using the appropriate energies of the modes (*Pourquoi les transpositions de modes? La première et moindre raison c’est pour reindre la même pièce de musique chantable par tout sorte de voix. La seconde et principale raison c’est pour l’expression des différentes passions, à quoi la différente énergie des modes est très propre*) (Charpentier, 2012).

*Ordre*), as a series of character pieces related to the same musical atmosphere, modal color and conceptual associative process. The assumption, that the introduction of Couperin's musical Orders followed the ideas of Louis XIV on the introduction of the original French orders in architecture (as opposed to the familiar Ionic, Doric, etc.) (Tunley, 2004, 119) may be adopted, as it leads to an ideological interpretation of Couperin's musical forms. Couperin's pieces are usually interpreted as dances, genre scenes and portraits of the aristocracy from his milieu. This author believes that such an interpretation, the application of an approach that is valid for later artists (Rameau), is not viable in Couperin's case. Numerous mythological characters are concealed in the titles of the pieces, and many names and surnames contain a hidden symbolism, metaphor, and allegory. An integrated symbolic interpretation of Couperin's intriguing titles reveals (through a comparison of all the orders and all the pieces in the same mode) Couperin's "order of modes"<sup>15</sup>. As an extension and modification of Charpentier's "*energy of modes*"<sup>16</sup>, Couperin's "order of modes" represents the Pythagorean-Orphic "road to perfection". Couperin's music is located on the border between modality and tonality; his modes include major and minor as a light-dark contrast. Couperin's "order of modes", the basis of his symbolic vision of harmony, his "harmony of orders", is presented below, and the titles of pieces which are clues to its interpretation are given in parentheses:

A major/minor – mode of the spirit (*La Logivière*)

B flat– mode of nature (*Les Baricades Mistérieuses*)

C major/minor – mode of knowledge (light) (*La Monflambert, Les Ombres Errantes*, the allegory of Plato's cave)

D major/minor – mode of reason (measure) (*Julliette*). In *Ordre 14* Couperin speaks metaphorically about birds, associations with Shakespeare and Juliet's monologue about the "nightingale and the lark", symbols of the opposing tendencies of love and reason.

E flat – mode of inspiration (*La Visionnaire*)

E minor – mode of love (*La Reine des Cœurs*)

F major/minor – mode of audacity (talent) (*L'Audacieuse, Les Tricoteuses*)

F sharp minor – mode of pain (ecstasy) (*L'Épineuse*, the way to wisdom *La Sophie* ())

G major/minor – mode of art (*Les Graces incomparable*)

B minor – mode of perfection (*Les Lis naissans; L'Exquise*)

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<sup>15</sup> The issue is explained in detail in the doctoral art project work of the author (Kutlača, 2012).

Harpsichord suites were the basis of Couperin's pedagogical engagement at the court and he conceived of them as a guide to the process of aristocratic education. Cultivating tradition and developing the spiritual values of imagination, fantasy, taste, balancing character, fostering generosity and magnanimity, had the ultimate goal of achieving perfection – the formation of the personality of the ideal courtier. Couperin's harpsichord oeuvre as a whole can be seen as a “universe of characters” or “harmony of Spiritual Orders”.<sup>16</sup> Couperin, the royal teacher of interpretations of music, links French inspiration from antiquity to the need for modernization, which is understood as the need for an individuation of society. The ideas guiding the Orders branch out through the French society of Couperin's time and analyze it, establishing an association with real people and real events, while being derived from an idealized core of moral values. Searching for a way to modernize the music of the turn of the eighteenth century, Couperin's pieces that can be associated with certain historical figures are not, in the view of this writer, their musical portraits, but on the contrary, the coloring of a piece within an Order for which it is impossible to find a correct definition, belongs to a personality - individual character known to his contemporaries. According to Platonism, supreme ideas are expressed by music, musical works are not a reflection of reality, but a reflection of ideas, their realization through specific instances, “the embodiment of the spirit”. Couperin's harpsichord works are a demonstration of the unification of Italian elements of expression with the French classicist vision of human society as a “universe” of values.

### **The Scientific Attitude to “Harmony”<sup>17</sup>**

The conflict classicist aesthetics and aesthetic feeling dates from the seventeenth century but continues in the eighteenth. A return to the idea of universalism in the eighteenth century may be found in the words of the dogmatic rationalist Charles Batteux (1713–1780): *The Fine Arts reduced to a single principle (Réflexions critiques sur la poésie et sur la peinture, 1746)*. He suggests that an aesthetic model should be sought in Newton's physics: “just as he reduces the variety of celestial phenomena to the single principle of ‘universal gravitation’, so in the sphere of aesthetics we should strive to reduce the diversity of rules that specifically act in works of art to a single rule” (Feri, 1994, 44).

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<sup>16</sup> Couperin's 233 pieces for harpsichord constitute 27 *Ordres*, which are grouped in four volumes (analogous to the four elements: earth, water, fire, air) are dedicated to: tradition, sensitivity, social life and the world of ideas.

<sup>17</sup> The contemporary philosopher Tzvetan Todorov in his work *Imperfect Garden* (2003) identifies four opposing families in the Enlightenment period: conservatives, individualists, humanists, scientists.

The Enlightenment is a product of the adoption of democratic ideals and was born in tandem with the strengthening of the bourgeoisie. The modernists (who emerged as victors from the *Querelle des Anciens et des Modernes*) transformed the rationalist notion of “universal harmony” into the aesthetic “sensation of harmony”. Enlightenment philosophers transform “harmony” into a “doctrine” – knowledge which may be available to everyone. Rameau was active as an artist in this period, and as a thinker himself belongs to a circle of respected luminaries (he corresponded with the philosophers D’Alembert (Jean-Baptiste le Rond d’Alembert, 1717–1783) and Voltaire (François-Marie d’Arouet, or Voltaire, 1694–1778), and the scientists Euler (Leonhard Euler, 1707–1783) and Bernoulli (Bernoulli, 1667–1748). As a theorist of music Rameau (Jean-Philippe Rameau, 1683–1764) was the author of the new doctrine of the inversion of chords and the principles of chord progressions which he would call the “science of musical harmony”. Rameau’s concept of harmony represents a demonstration of Batteux’s ideas of the “unique principle”. It is known that as a composer Rameau (as opposed to a group of admirers of Italian music, among whom François Couperin and Charpentier were prominent) was an advocate of returning to the French tradition. The very term “science of harmony” is controversial, modern and conservative at the same time: Rameau acts as a devotee of science, explores the laws of physics and acoustics, acting as a scientist, but establishes (something which is often lost sight of today) the connection of his discoveries with the ancient idea of “harmony” which in French culture is a sign of the presence of the Platonic idea of forming an ideal society.

The democratization of knowledge would be reflected in a new disagreement regarding the meaning of “harmony”. In the dispute known as the *Querelle des Bouffons*“ (1752–1753), Rameau and Rousseau represent different attitudes towards music and the importance of “harmony” therein. The essence of their conflict is a different understanding of nature: while Rameau sees nature as physical reality in which mathematical principles operate, Rousseau sees nature as the nature of man, his inner world of passion and emotion. Rameau gives priority to harmony in music, while Rousseau holds that melody is more important, reflecting the passions by the accentuation of speech (Marques de Almeida, 2014). Rameau too considered melody to be important, but in line with the basic principles of his theory a “good” melody is based on the harmony. Rameau expressed his approach to the question of harmony most clearly in the work *Observations on our instinct for music, and the principles of sound* (*Observations sur notre Instinct pour la Musique et sur son Principe*, 1754): “Tout

est dit quand (la nature) a une fois prononcé<sup>18</sup>. “L’harmonie qui cause cet effet n’est point jetée au hasard; elle est fondée en raisons, et autorisée par la nature même”<sup>19</sup>. By comparing music with speech, and insisting on freedom, directness and simplicity of expression, Rousseau awarded harmony an insignificant, supporting role.

The conflict with Rousseau stimulated Rameau to undertake new experimental acoustic research, which was a confirmation of the physical presence of the legality of “harmony”. Rameau approaches timbre mathematically, as did Mersenne, and by a process of analysis-synthesis in organ experiments, he demonstrated the presence of higher harmonics in forming primary tone colors. Color has a “mysterious” effect on humans; color is fusion and it was possible to explain sound color by analogy to the decomposition of light in a rainbow. Rameau experimented with the operation of the resonant body of the instrument and the action of acoustic spaces. Based on an analogy with the resonance of physical bodies in space, Rameau introduced the psychological concept of “resonance” as a principle of music’s effects on man (Fales, 2005). “Resonance” has the property of unification, the senses can be deceived, and the goal is to experience the “harmony”. Rameau’s research established a bridge between ancient beliefs about the coherence of the universe and contemporary scientific discoveries.

Rameau’s work is a demonstration of his desire to integrate the separate disciplines of science and the arts, and an invocation of the idealism of “Golden Age” of French culture. Rameau’s concept of “harmony” reflects the duality of his scientific attitude and his ideological cultural affiliation. Rameau was defeated at a given historical moment and Rousseau’s views were victorious. Rameau’s large oeuvre, based on an ambivalent idea of “harmony”, disappeared from the artistic scene in the period of the French bourgeois revolution.<sup>20</sup>

## Conclusion

The naturalistic, mystical (Orphic), or scientific vision of the universe, in which music is the “echo”, “ideal” or “knowledge” of universal values, is analogous to the corresponding vision of an ideally regulated society: absolutist, aristocratic or democratic. The difference in the

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<sup>18</sup> “Everything has already been said once (nature) has said it” (Lescat, 1987, 7).

<sup>19</sup> “The harmony that causes this impression is not an accidental occurrence: it is rationally designed and approved by Nature itself” (Lescat, 1987, 7).

<sup>20</sup> At the very end of his career, he entered the service of the court, but the aristocracy had abandoned him, and his opera *Les Boreades* was not performed, due to the presence of the revolutionary ideas of freedom (Moritz, 2003).

perceptions of seventeenth and eighteenth century French artists, evident in the methods they used, is also reflected in their concepts of “harmony”: the seventeenth century is characterized by the Cartesian method and “harmony” is conceived by deduction based on the vision of the universe. Artists at the turn of the eighteenth century prefer experience, sensibility: “harmony” becomes the integrating factor, the atmosphere. Enlightenment philosophers favor the experimental establishment of physical laws; “harmony” is transformed into a method of harmonizing melodies. All of them are connected by a thread: the artist and the art do not venture beyond the scope of nature. Only in the late eighteenth century does the question of the irrationality of the work of art appear, and art becomes autonomous in relation to society; the idea of “harmony” loses its social dimension and becomes an aesthetic and theoretical concept.

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