

THE RECEPTION OF THE J. HOENE WROŃSKI/C. DURUTTE THEORY IN THE LIGHT OF
 MATHEMATICISATION OF MUSIC IN THE 20TH CENTURY¹

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In the 19th century the year 1855 turned out to be one of the surprisingly important dates in the history of French theory of music². What surprised the wide musical circles? The appearance in print – in Paris and Metz – of a new, huge and in a way completely unpredictable treatise on harmony. It was written by the French composer and theoretician Camille Durutte. The author called it *Esthétique musicale. Technie ou lois generales du système harmonique*. There are no similarities between this work and analogous theoretical writings on harmony. The treatise was based on *The Philosophy of Absolute Music* by Józef Hoene Wroński, quoted as reference – it is important to note that Hoene Wroński gave his treatises personally to Durutte. Durutte's other source was Hoene Wroński's *Law of Creation*, cited in its architectural form, known only from the French publications of the works of the Polish philosopher.

The relationship between the philosophical idea and the theoretical musical idea is – generally speaking – a natural phenomenon in the history of music theory. However, in this case the directness of the relationship between a complicated philosophical theory and its musical appropriation is rather peculiar. One could see it as belonging to a separate branch of the history of music, i.e. the study of relations between philosophy and music theory. This branch seems not to have been developed by musicology sufficiently.

One should mention here that in the middle of the 19th century other philosophical concepts were appropriated by music theory, e.g. Moritz Hauptmann's in Germany or that of the 18th century Scottish philosophers as referred to by Abramo Basevi in Italy.

The Law of Creation was applied to music in all its constituent parts, which were given exact musical names of the elements of the so-called “*Autothesis*”. One feels strongly that the system is complete, which is a mandatory feature of a theory of this type. Still, Durutte openly admits that he had certain difficulties with the lack (in the architecture of the *Law of Creation*) of a genetic formula for chords, which had to be added to the musical application of the system, hence created

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out of necessity. Durutte discovered his genetic canon, which led him to creating a new musical theory, which is in full accord with Hoene Wroński's *Philosophy of Music* and the *Law of Creation*. This is a convincing proof that Durutte's thinking was independent and that he can be justly treated as the author of his own theory.

To fully understand the theory one has to have a good knowledge of Hoene Wroński's musical texts, which were at the disposal of Durutte and to which he makes references.

One has to add, however, that Durutte's knowledge of Hoene Wroński's philosophy was not limited to his first writings, which clearly indicates that his relationship with the Polish *Messianism* was not occasional, but deep and intentional. In this sense the discussed theory becomes part not only of Polish musicology but also of the history of Polish philosophy.

Durutte's theory is naturally connected with his next big theoretical work, *Esthétique. Résumé élémentaire de la Technie harmonique et complément de cette Technie, suivi de l'exposé de la loi de enchainement dans la mélodie, dans l'harmonie et dans leur concours*, Paris 1876, and more precisely with its first part. The first part of the treatise is a modified, shortened version of the first treatise and the second part is a further development of the theory. In consequence, when one studies Durutte's theory of harmony, one has to take into account both sources, as well as *Harmonic Studies* by Auguste Barbereau from 1853. (Barberau was Durutte's teacher). His thinking is important and organically, even genetically connected with the discussed theory. Another important source is the early critical reception of Durutte's theory by François-Joseph Fétis, the greatest music theoretician of the time. Fétis and Durutte debated in public in 1862, thus creating a most valuable document for the reception of the theory.

One could say that from the perspective of reception this theory the 20th century begins with Vincent d'Indy and ends with the monographic publication of the eminent Italian musicologist Angelo Orcalli on Durutte's aesthetics. In this prolonged period one can observe an interesting historical evolution in the way the J. Hoene Wroński/C. Durutte theory is perceived.

The importance of the theory is also well documented in the 20th century, and a particularly interesting thread can be found in the thinking of important 20th century composers who took deep interest in the mathematicisation of music. We will examine here four instances: Konstanty Regamey, Edgard Varèse, Arnold Schönberg and Iannis Xenakis.

KONSTANTY REGAMEY

Konstanty Regamey published three articles in the Warsaw journal called *Zet* (1932, No 5, 6 and 9) devoted to his study of the basic questions of Hoene Wroński's philosophy of music. The author went too far in editing out what to discuss or not, and one cannot fully grasp the original idea when reading Regamey's articles. However, his articles were the first Polish attempt to professionally present the theory to a wider readership. Previously the theory was hardly accessible, also because it was published only in French.

(1) The first article is about "the metaphysical foundations of music." The author assumes that metaphysics is central for a theory of music, which aims at creating a definite system, detached from any empirical knowledge. The constellations of sounds are not conditioned by their physical being, nor by the structure of human hearing. This philosophy assumes, then, that its general principle is based not on "sonality" but on "tonality" – to use Hoene Wroński's own terms.

If neither acoustics, nor psychology can explain the foundations of music, with its scales and harmonic functions, then one has to assume that there is a close relationship between musical phenomena and mathematical relations. Even mathematical laws cannot fully explain the laws governing music, although they are closer to music. And – as Regamey rightly says – they give us the form of the musical reality without the possibility of determining its content. Regamey indicates the fundamental factor: rhythm is the quantitative aesthetic division of time, while the pitch is also a function of time – its qualitative aesthetic division. Music gives one an insight into the nature of time, and – to use an analogy here – it is for time what geometry is for space.

(2) The second article is devoted to "Wroński's Philosophy of Music". The philosophy is limited to the *Law of Creation*, i.e. the main foundation of any reality, hence also the musical reality. Regamey presents the basic part of the *Law of Creation*, with its two poles, *Being* and *Knowledge* that is the physical and the intellectual; conditions of the tone, as well as a neutral element, which unites the two extremes. Only this basic part of the *Law of Creation* is discussed, with the addition of certain conditions, aesthetically important in the process of constructing a musical scale. The text is based on general concepts, without reference to purely musical terms, which – in an attempt to explain the extreme elements – would have to take major and minor thirds into account. For the neutral one would have to take into account also the natural fifth.

(3) The last article entitled “More on Wroński’s Theory of Music” takes as its aim the presentation of consequences of the basic assumptions, previously called metaphysical and philosophical. It discusses the aesthetic value of intervals and the way in which they are mathematically expressed. It also introduces a certain distance towards the “absolute scale”, which was sent by Hoene Wroński to Durutte in a letter, as Regamey cannot see how to obtain this scale. He rightly appreciates the value and importance of the principle of the “rhythmical numbers”, making references to Johannes Kepler’s *Harmonices mundi libri V* and the mathematical theory of the division of the circle (emphasised in the J. Hoene Wroński/C. Durutte theory). “The relevance of musical intervals – writes Regamey – to the division of the circle is not an accidental analogy. We see the flashes of simultaneity of laws governing the periodicity of temporal beings in space. To draw attention to this fact is clearly Wroński’s merit.”

Regamey concludes his series of articles with a reference to the very important idea put forward by Francis Warrain, who counts among the most important specialists in the philosophy of Hoene Wroński. Regamey, as one can conclude, seems to share Warrain’s convictions: for Warrain in Hoene Wroński’s works one can see an effort to “create the whole theory of music from the concept of rhythm (although understood very broadly: quantitatively, as the actual rhythm and qualitatively, as the pitch)”. According to Warrain music is based – apart from rhythm – on the “principles of contrast”. At this very point – the principle of rhythm with the principle of contrast – one can see how Hoene Wroński’s and Charles Henry’s philosophies are closely linked. It should be – writes Regamey – highlighted, which is an important point in the theory of music.

In the three articles Regamey emphasises the fact that Durutte is rarely mentioned as the author of this theory of music, which he put forward in his two big treatises. One can suspect that Regamey wrote his articles basing on the *Technie*, treatises by Durutte, as it was in these treatises that the *Philosophy of Absolute Music* (a fragment) was originally published. Another possibility would be to see Henry’s brochure from 1887 as a possible source. Both theories are closely connected, so yet another supposition is possible, i.e. that Regamey as a composer absorbed the ideas of Durutte-the-philosopher, whereas he was not interested in Durutte and his thinking as a composer. However, Durutte’s treatises belong to the history of music, and their didactic role is secondary. They are an important source for the study of Hoene Wroński’s philosophy of music and for understanding of this philosophy as an inspiration for a new theory of music. This new theory combines the elements of the old theory and new ideas, creating a new quality. Hoene Wroński’s

philosophy of music should serve the purpose – according to its self-proclaimed ideals – of creating a musical *technie*, and not a theory of music in the traditional sense; Durutte makes it absolutely clear. Still, the whole issue, fundamental for the discussed subject, was not included in Regamey's articles. Generally his interest in this theory seems to have been a long lasting one. In 1960 he took part in a conference in Paris, which was entitled *La Résonance dans les échelles musicales*. Regamey's lecture – “Les théories de l'harmonie moderne” – was published in his *Le développement de la résonance dans les musiques évoluées*, Paris 1963.

EDGARD VARÈSE (1905–1959)

Edgard Varèse confessed in his souvenirs in 1959 that in his youth, when he was working in search for new music, the major change happened under the influence of Hoene Wroński's idea of philosophy of music. “It was for me – he wrote – new, strongly inspiring and the first really new conception of music”.³

Varèse refers to the famous phrase describing the subject of music to be “the reason personified in sound”. It prompted Varèse to think about spatial understanding of music, which he developed in his own compositions. He followed this very idea to the end of his life. He hoped that his last composition from 1958, *Poème électronique*, would further enrich music – music understood in the Hoene Wrońskian way.

Taking into account Varèse's personality, and above all his output as a composer, which occupies a canonic place in the New Music of the 20th century, one has to say that he is too important not to be taken into account in the consideration of the reception of the J. Hoene Wroński/C. Durutte theory. Even if Hoene Wroński's aesthetics apply to all the arts, in music they find a special relevance. Indeed, Hoene Wroński has a magnetic force, which keeps great minds in a kind of thrall.

ARNOLD SCHÖNBERG (1911)

Similarly like Durutte, yet not being aware of his theory, Arnold Schönberg in his *Harmonielehre* from 1911 does not accept any “foreign” harmonic sounds, to which he devotes a separate and quite extended chapter: “Harmoniefremde Töne gibt es nicht, den Harmonie ist Zusammenklang”.

³ Odile Vivier, *Varèse*, Paris 1973, p. 15.

Schönberg adds that these sounds are foreign only and solely to the harmonic system, while they are not chords of the system but of music”.⁴ In case of Durutte they are actually not the sounds of the traditional system but of a new system. *Harmonielehre* clearly shows how current and topical this issue was for the theory of music approximately 60 years after the publication of *Technie*. It also shows how revolutionary it must have seemed then, in the middle of the 19th century, to deny the existence of foreign sounds in the harmony of such composers as Gioacchino Rossini and Charles Gounod. It was revolutionary compared to the period of Schönberg. Even August Halm in his *Harmonielehre* would still be able to say: “History of music is the history of dissonance”.⁵ Anything that sounds harmoniously together is harmony – says Schönberg. Foreign sounds create consonances hence they are not foreign to harmony:

„Harmoniefremde Tone gibt es nicht [...]. Denn das natürliche Vorbild, der Ton, ist geeignet, noch ganz andere Zusammenklänge als Akkorde zu erklären als diese einfachen. Und zu diesem Vorbild stehen wir im Verhältnis des Analysierenden, Suchenden: indem wir es nachahmen, entdecken wir mehr oder weniger seiner Wahrheiten. Mehr, immer mehr strebt der schaffende Geist an, weniger genügt dem Genießenden. Zwischen diesem Mehr und diesem Weniger spielen sich Kunstkämpfe an”.⁶

IANNIS XENAKIS

It is fully justified to mention Iannis Xenakis, his stochastic music and his theories as a symbol of the relationship between New Music of the 20th century and its relations to mathematics. The relationship with the 19th century Theory of Durutte is obvious. However, Durutte had the option not to use mathematical formulae for the theoretical description of a musical work that was still kept in the frame of the tonal system. Xenakis, on the other hand, could not avoid using mathematical formulae as his idea of a musical work was directly connected with a mathematical idea.

Xenakis uses what is referred to as “art-science” as a leading concept, and his phrase “that to make music is to express human intelligence through sound” resembles the famous idea of Hoene Wroński, which so much inspired Varèse.⁷

4 Arnold Schönberg, *Harmonielehre*, Wien 1909-1911, 3 ed./ 1922, pp. 384,389,390.

5, August Halm, *Harmonielehre*, Leipzig 1905, Berlin und Leipzig 1920, p.128,

6 Schönberg, *ibid.*

7 Iannis Xenakis, ‘Musiques formelles’, *La Revue musicale*, No. 253-254, Paris, 1963, p. 211.

Taking into consideration the influence of mathematics on music in the 20th century one should clearly point to Durutte as a pioneer – he was once accused of overmathematicising music – and seen as an important influence both on 19th and 20th century musical theory and – to a limited extent – musical practice.