

Horațiu Rădulescu and the Intangible Dimensions of Plasmatic Music
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Draft version

“The reasonable man adapts himself to the world; the unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man.”

George Bernard Shaw
Man and Superman

A plethora of contradictions shrouds Horațiu Rădulescu’s world of sonic landscapes and mystic beliefs. His works can open unseen doors to the surreal and sublime, by defying most people’s expectations of what music ought to be. Haunting concert experiences are commonplace. References to divinity, ancient rituals, Byzantine chant, and the Far East, paint a fantastic panorama of far-away places and times.

While sound plasma is not a contradictory concept, many of its dimensions remain intangible, not because of our inability to comprehend them, but because this is how they were meant to be. Rădulescu adored the in-between and the unattainable. Like so many other twentieth-century composers, he was fascinated by the exploration of new musical textures while searching for the essence of sound, before spectral music was discussed in theoretical texts. For many years he was interested in heterophony, before becoming the inventor of plasmatic music, and a surprising folk-inspired neoclassicist of sorts, in his late piano works. Ingenuous and sophisticated, always suggestive, his music also reveals the rarely explored points of intersection where mathematics and poetry meet: “I was very strong in mathematics, and everyone thought I was going to become a scientist. But I wanted to do a slightly more poetic type of mathematics and dedicate myself to music.”¹ Many saw him as a philosopher of sound, exceptionally creative, and equally rebellious.

From woodwind to strings or prepared piano scores, and solo instruments to chamber ensembles, the graphic representation of sound plasma was rarely the same. The development of new notation systems during the 1960’s was a fashion, and Rădulescu didn’t shy away from joining it a decade later. Yet his desire to notate differently came from the need to compose differently. Reflecting upon the very meaning of music while continuously shaping new textures ultimately brought about important questions on the limitations of traditional music notation, especially when it came to its causality. For centuries, the western world worked slowly on developing a notation system that removed approximation between what was seen, what was played, and what was ultimately heard. Horațiu Rădulescu saw this old routine as a significant obstacle in the creation of plasmatic music, which is why he sought to return much of the initiative and decision power back to the performer. Beautifully imagined, his scores were conceived and engraved with a great sense for allegory. In addition to mathematics, he cultivated an interest in poetry and painting for decades, and often included elements from these two artistic domains in his scores.

¹ “Horațiu Rădulescu: la composition des nuages” in *Le monde de la musique*, interview with Nathalie Krafft (Paris, June 2001, no. 255), 46.

Today, approaching his music can be challenging for performers and conductors alike, especially when encountering scores with vague suggestions, lacking specificity or qualified editing. It is not uncommon for the most experienced musicians who knew him to travel long distances in order to train the new generation of performers willing to tackle his works. In fact, his music is still a rarity in stores and libraries anywhere, as the current guardians of Lucero Print, Rădulescu's own publishing house, are still working on developing an effective distribution system.

Horațiu Rădulescu's allure throughout Western Europe's circles of spectral aficionados remains in sharp contrast with a fairly deep skepticism and the occasional rebuff within the academic realm. For the more scrupulous minds, some of his theories can be challenged for a certain lack of scientific rigor, or a clear path towards application and palpable results. Among them, there are the writings on the subject of brain and sound resonance, or the application of the sum and difference tones principle, which becomes relevant only in very specific acoustic conditions. Rădulescu spent a considerable amount of time exploring the phenomenon of combination tones, also known as Tartini tones, without pointing out that in most real-life situations its consequences will likely remain negligible.² Ironically, the very elusiveness and unreliable nature of the sum and difference tones phenomenon became an intrinsic dimension of sound plasma, as I shall discuss later on.

Rădulescu's controversial persona was even more pronounced in Romania, where his music remained virtually unperformed and undebated for more than two decades, following his defection at the age of twenty-seven. Many other composers left during the 1970's, all of them quickly expunged from the Romanian Society of Composers and eventually erased from the public memory. Following the same scenario, his application to join the organization was accepted a year after his departure, in 1970, until his membership was cancelled in 1975, a year after his French naturalization.³ While presenting works arriving from the Romanian diaspora was extremely rare during the communist era, the skepticism continued even after Rădulescu's return visits to Bucharest, when only *Iubiri* and *Das Andere* were performed at the first and second editions of the International Week of New Music, in 1991 and 1992 respectively. During the mid 1990's, at a time when all travel restrictions were lifted, his music remained absent from the most important contemporary music festival in Romania for five consecutive years.

Although deeply rooted in the primordial rituals of shepherds and village musicians, his works did not blossom as a result of thorough ethnomusicological field research. This wasn't even an option for much of his life. His departure brought about an array of new opportunities, but also closed the door on the wealth of musical resources in his homeland, particularly within the folk tradition. To the western ear, his unusual textures and instrumental techniques have always painted an exotic landscape, while at home, they appeared as a natural extension of a rich folk practice, well studied and understood. Perhaps this is the reason why Romanian academics have yet to get excited about his works, which although full of poetry and symbolism, retain a familiar sound. Adding another layer of mystique, a charmingly ethereal feature of his music stems from his Romanian titles, such as *Mioritic Space*, *A Doini*, or *Doruind*, which carry a particular aura for the native speaker and are at the same time untranslatable. All these and so

² Over the last four centuries, the phenomenon of sum and difference tones was discussed to various degrees by Giuseppe Tartini, Joseph-Louis Lagrange, Thomas Young, Wilhelm Weber, Georg Ohm, and Hermann von Helmholtz, among many others.

³ Octavian Lazăr Cosma, *Universul Muzicii Românești* (Editura Muzicală, București, 1995), 431.

many other contradictions have painted a mystical portrait of an elusive composer, whose music is equally admired and misunderstood.

A decade after passing away, Horațiu Rădulescu remains among the more visible members of the Romanian postwar avant-garde, especially throughout Western Europe. Yet, he was not a founding member. The birth of a forward-looking movement in Bucharest is inextricably linked with the gradual relaxation of political pressure that began in 1963, when the Romanian government started to slowly distance itself from the Soviet Union. Although the latest developments in the west were known and shared by small groups of composers since the 1950's, a public debate of new aesthetic directions and compositional techniques was not possible under the local censorship.⁴ In 1961 for example, when Aram Khachaturian was visiting the Bucharest Conservatory together with his Moscow colleagues, the composition students presented neo-classical works. During the mid-1960's however, a series of well-publicized new music conferences began at the Bucharest Conservatory under the leadership of musicologist George Bălan, who was already writing articles in support of modernist trends in the *Contemporanul* newspaper. Under the auspices of George Bălan, works by Varèse, Xenakis, Boulez, Stockhausen and many other contemporary composers were presented to a wide audience comprised not only of musicians, but also writers, architects, doctors, and engineers. It was during these seminal years, that the concept of plasmatic music was born, at the Bucharest Conservatory.

Following an overview of the latest European and American developments in music, local composers were eventually invited to present their own works and research. Among them, Ștefan Niculescu, one of Rădulescu's mentors at the conservatory, focused his attention on the study of heterophony and proposed early on that Romanian composers develop a school of thought distinctive from the Polish avant-garde, which continuing on the footsteps of Xenakis, was centered on sound mass (*textură* in Romanian).⁵ At that time, the parallel with Polish music was particularly meaningful, as Niculescu was invited together with Aurel Stroe and Tiberiu Olah to present his works at the prestigious *Autumn in Warsaw* festival for the first time in 1965.⁶ It was noted that while both sound mass and heterophony can trace their origins to a single sonic event, multiplied and desynchronized, its occurrence in sound mass is detuned, as opposed to tuned, in heterophony.⁷ He also suggested that while sound mass has its source in the environment, heterophony was rooted in ancient folk traditions. Niculescu's early studies of this syntactic category – as he called it – in George Enescu's music, underscored the fact that heterophony had strong roots in the thriving but often overlooked music of the peasants, so it shouldn't have been a foreign concept for the new generation of composers.⁸ This is how Niculescu defined heterophony:

⁴ Ștefan Niculescu, *Reflecții despre muzică* (Editura Academiei Române, București, 2006), 140.

⁵ Andra Frățilă, „De vorbă cu Octavian Nemescu”, in *Muzica* (București, No. 1, 2016), 4.

⁶ Iosif Sava, *Ștefan Niculescu și galaxiile muzicale ale secolului XX* (Editura Muzicală, București, 1991) 91.

⁷ Octavian Nemescu, interview with Liviu Marinescu (Bucharest, Romania, May 29, 2011).

⁸ In 1926, Enescu made extensive use of heterophony in his *Sonata for Violin and Piano No. 3, Op. 25, in Romanian Folk Style*, with occasional occurrences in numerous other works written prior to World War I.

Let's say that we have a model, a structure, or a melody, for example. From this melody, I can create two or more versions. Then, I play these versions concomitantly. This is heterophony: more versions of a structure that are heard simultaneously.⁹

It should be noted that while Niculescu is generally credited with the introduction of the theory of the four syntaxes in Romania, he was always careful in pointing out that the term had a different meaning in music as opposed to linguistics. In fact, for this distinction to be clear, he often used the term "syntactic categories".¹⁰ Surprisingly, the discussion on Ligeti's micropolyphony occurred later on, since Niculescu was not aware of his music until 1966, when he heard a performance of *Lux aeterna* at Darmstadt.¹¹ Decades later, a comprehensive examination of heterophony and micropolyphony took place in a panel discussion between Niculescu and Ligeti moderated by Karsten Witt, during the 1992 Wien Modern Festival.¹²

In 1965 the leadership searched for a new voice, and eventually Corneliu Cezar, a recent graduate of the composition program, was invited to the podium to present his ideas. Horațiu Rădulescu was in the audience as well, after being away from the conservatory for a few years.¹³ In a very strong fashion Cezar attacked serialism and aleatorism, and proposed at the same time a return to the fundamental and its first overtones, as opposed to the exploration of sound mass and clusters, which appear in the higher partials. While Niculescu and his colleagues were rather troubled by some of these new ideas, Cezar found strong support among his own generation. Before the first wave of avant-garde composers could assert its aesthetic position, a second one was already emerging. A conflict between these aesthetics and techniques did not occur, however. As composer Octavian Nemescu noted in a recent study devoted to the Romanian avant-garde: "The aesthetic attitude of the composers from the 1960's had the qualities of a friendly revolution, without the vehement behaviors of their colleagues from the west."¹⁴

In a letter to Nemescu discussing the beginnings of this second wave, another composer from the same generation, Lucian Meșianu, recalls one of these turning points: "One day Corneliu Cezar invites us to his place, and to our astonishment we find him holding a small electric fan, on which he tied stripes of leather. He proceeds to move it up and down the lower strings of the piano. We were all astounded by the harmonies created by the interfering overtones. Passionate discussions followed, concerning different tuning techniques and the development of a new notation system. There are few of us today who can talk about this period of effervescent searches, when a real bond existed between all the young composers who sought to overcome the old ways."¹⁵ Decades later, when discussing his sound icons – prepared pianos

⁹ Niculescu, 141.

¹⁰ Corneliu Dan Georgescu, "Categoriile sintactice muzicale după Ștefan Niculescu; noi contexte și perspective", in *Muzica* (București, Nr. 2, 2017), 26.

¹¹ Niculescu, 142.

¹² Niculescu, pp 137-156.

¹³ Nemescu, 2011.

¹⁴ Octavian Nemescu, "Avangarda în muzica românească", in *Muzica* (București, No. 1, 2010), 6.

¹⁵ Lucian Meșianu, *Corneliu Cezar Vizionar*, letter to Octavian Nemescu (Lausanne, Switzerland, September 7, 2010).

positioned vertically, played with bows and rosined threads – Rădulescu recalled the origins of his idea without mentioning whether or not he was influenced by Corneliu Cezar:

We built spider webs of nylon threads of different thicknesses in between the pianos, because there are several sound icons, you can use as many as you like, even seventeen sound icons, big grand pianos vertically placed. You transport them without the lid, and you can see only the bronze and the strings. And sometimes you perform with rosined fingers on some of the threads, exciting more than one piano at the same time. [...] I did this mostly at home. Maybe since '64, '65, something like that.¹⁶

The first works from this new wave of experimental composers came shortly. In 1965, in the Bucharest Conservatory Electronic Music Studio, Corneliu Cezar composed *AUM*, an eletroacoustic piece that superimposed incantations and poetry readings on a low C drone and its first 16 partials. Two years later, Octavian Nemescu composed *Iluminații* for orchestra, in which a drone is multiplied and divided based on calculations that also establish the proportion and duration of each partial. The work was published in 1969 and premiered in 1971. Many other early spectral works followed, including Nemescu with *Concentric* in 1969, and Meșianu with *Pytagoreis* (created in Cologne in 1970). With foreign trips by Meșianu sponsored by the British Council in 1967, and the German government in 1970, these discoveries were not hidden from the west.¹⁷ Furthermore, in 1972, both Nemescu's *Concentric* for ensemble and tape and Stockhausen's *Stimmung* were performed at Darmstadt.

The openness of the Romanian regime vis-à-vis the artistic elite and its new forms of expression continued to slowly grow during the late 1960's, particularly in music and literature. For many of the young composers at the Bucharest Conservatory, these years were characterized by an unmatched sense of hope and confidence in the need to forge ahead. While Ștefan Niculescu was able to travel abroad and bring back scores and recordings of new music to his students, a wide range of exciting concerts and conferences took place at home as well. Nemescu often talked about an exhibit organized by the U.S. Government in 1968, which brought for the first time to Bucharest the music of La Monte Young. There was also hope on the political scene. During the same year, when Ceaușescu made a much-publicized statement against the Warsaw-pact nations' invasion of Czechoslovakia, the world was stunned. Unfortunately, these hopes were going to fade as soon as Ceaușescu visited Kim Il-sung's North Korean utopia in 1971 and decided to import his unique brand of personality cult.

At the Bucharest Conservatory, Rădulescu studied musical analysis with Ștefan Niculescu, who was well-known for his inspiring lectures on a wide range of composers, from Gesualdo, Monteverdi, and Bach to Webern and Stravinsky.¹⁸ Among the works he completed in Bucharest in 1967, Rădulescu's *Omaggio to Scarlatti* for piano still exhibits remnants of dodecaphony, a technique that Niculescu had mastered as well but was slowly moving away from. In fact, during this time Niculescu was teaching his students compositional techniques that involved series of syntaxes or series of heterophonies. Composed in 1968 and published in

¹⁶ Bob Gilmore, "Wild Ocean: An Interview with Horațiu Rădulescu" in *Contemporary Music Review* (2003, Vol. 22, Nos 1/2), pp 111-112.

¹⁷ Lucian Meșianu, telephone conversation with Liviu Marinescu, Sept. 16, 2011.

¹⁸ Gilmore, Wild Ocean, 108.

Germany in 1971, *Leagăn abiselor* for solo piano or harpsichord, shows a strong influence from Byzantine chant. Like *Omaggio to Scarlatti*, the piece begins with a single line in the middle register, which is gradually expanded to include the low and high registers of the instrument. While the work is generally fluid, with numerous heterophonic moments, the traditional notation and the very nature of the instrument remain major obstacles in the creation of a more unique texture.

In 1969, after further discussions with Corneliu Cezar about his theories, Rădulescu started working on a large-scale piece for nine cellos called *Credo*. The composition was based on the forty-five partials of a low C fundamental, where: “the first cello plays nine different types of music, the second one loses one but expands the remaining eight, until the last cello has only one type of music left to play, totaling over fifty-five minutes.”¹⁹ It is not clear how much of the piece was actually written in Romania, as in his discussions with Nemescu he only described a series of performance techniques, without showing a score. Among them, Nemescu recalls the idea of playing high on a string, away from the fundamental, where extended techniques like *flautando* and *sul ponticello* would recall the old sounds of mountain shepherd instruments, like the *bucium* (alphorn) and the *caval* (long wooden flute). Rădulescu would often state how important it was “to make these string instruments sound like something else”, perhaps ancestral instruments, that would “take us back to the origins”.²⁰ He also described the basic idea behind this work to Niculescu, right before his graduation and eventual departure from Romania.²¹ Much of the piece was improvised, with no calculations regarding partials; for this reason the Romanian school of thought places *Credo* at the beginning of empirical spectralism, which is quite different from the wave represented by Cezar, Nemescu, and Mețianu, who were known to write “music on the natural harmonics” or “archetypal music”. While the label “fundamentalist music” circulated occasionally as well, it became unusable after the Iranian Revolution of 1979. In fact, the appearance of the term “spectral music” came right on time as Hughes Dufourt was working on his seminal article.²² Coincidentally, 1979 is also the year when *Credo* was premiered in Saarbrücken, Germany, reason for which this piece had little impact on Rădulescu’s recognition as an early spectralist.

Clearly, the basic concept behind plasmatic music was developed during Rădulescu’s studies with Ștefan Niculescu at the Bucharest Conservatory, when ample discussions focused on the four syntactic categories took place amongst faculty and students. Years later, Rădulescu stated that his main goal was to avoid placing music within the four categories of monody, polyphony, homophony, and heterophony, by creating a type of texture in which all elements are in a state of constant motion.²³ Interestingly, Rădulescu’s desire to work in-between the four traditional musical syntaxes can be paralleled with physics, in which numerous other states of matter have been observed in recent years. Thus, in 1969, Rădulescu brought with him to Paris the ideas and ideals of a new generation of Romanian spectralists, which unfortunately were

¹⁹ Ruxandra Arzoiu, “Un interviu cu Horațiu Rădulescu”, in *Muzica* (București, No. 2, 1992), 149.

²⁰ Nemescu, 2011.

²¹ Gilmore, *Wild Ocean*, 112.

²² Hugues Dufourt, “Musique spectrale: pour une pratique des formes de l’énergie” in *Bicéphale*, (no. 3, 1981), pp. 85–89.

²³ Bob Gilmore, “Remembering Horațiu”, in *The Journal of Music* (No. 1, October 1, 2009), pp. 20-21.

going to remain in the shadows for almost two decades, as the Iron Curtain began to close in 1971. Although Rădulescu never mentioned the existence of a thriving spectral movement in Romania, it should be noted that many of the techniques and themes he brought to the West (heterophony, Pytagora, exploring the overtone series, sound icons) were already being discussed and occasionally employed by his older colleagues.

In 1972, after three years abroad, Rădulescu reconnected with Nemescu and a group of other Romanian composers at the Darmstadt courses, where he presented his theories on sound plasma, together with a performance of *Flood for the Eternal's Origins*. Like Mețianu, who composed *Pytagoreis* in Cologne, Rădulescu continued to be very much interested in the ideas of the Greek philosopher and mathematician:

In 1969-70, with opus 11 *Flood for the Eternal's Origins*, we concluded that it was necessary to “enter into” the sound, to rediscover the ocean of vibrations that Pythagoras scrutinized two thousand years ago.²⁴

The different destinies of the Romanian spectral movement were gradually splitting, though, after his mentors and colleagues returned to Bucharest to an artistic environment in remission. In fact, Corneliu Cezar was originally included in the delegation heading for Darmstadt, until the communist party replaced him with a composer-informer.²⁵ Meanwhile, Rădulescu's ideas and career continued to blossom. During the same year, he became accustomed with the music of Giacinto Scelsi, and visited one of Messiaen's classes at the Paris Conservatory.

At Darmstadt, Rădulescu presented the second important dimension of plasmatic music: undermining the cause and effect relationship. In a very extensive informal discussion recorded by Iancu Dumitrescu in 2004, when asked how the idea of plasmatic music was developed, Rădulescu answered:

I ran out of many resources. In fact, François Bayle took this idea from me, and started writing acousmatic music. I told him as early as 1972: I hide the cause and effect relationship through divinization.²⁶

The concept of acousmatic music was well-known in 1972. While its various definitions in modern music circles are occasionally subject to debate, it is generally agreed upon that acousmatic music involves sounds with no recognizable sources. Over the last few decades, the term has been applied extensively to the concert experience of electroacoustic music, since speakers are involved. Although François Bayle is often credited with the wide circulation of the concept in the 1970's, similar practices can be traced all the way back to Pythagoras, who was teaching his disciples to perform behind a veil, in order to hide their presence. These circles of disciples were called “akousmatikoi”, from the term “akousma”, which in Greek means “something heard”. Throughout the 1950's and 1960's, Pierre Schaeffer discussed acousmatic

²⁴ Horațiu Rădulescu, “Musique de mes univers”, in *Silences*, (No. 1, 1985), pp. 50-56.

²⁵ Nemescu, 2011.

²⁶ Iancu Dumitrescu, “Dialog cu Horațiu Rădulescu: Musique spectrale, composition, creation, vie”, YouTube, accessed on July 12, 2010.

music while trying to define the realm of *musique concrete*, in which the sources were hidden behind another imaginary veil, created by modern technology:

The acousmatic situation, in a general fashion, symbolically prohibits any relationship with what is visible, touchable, measurable. Furthermore, between the experience of Pythagoras and our experiences of radio and recordings, the differences separating direct listening (through a curtain) and indirect listening (through a speaker) become, in the end, negligible.²⁷

Rădulescu's desire to hide the cause and effect relationship was as much about questioning our associations between the visual and the audible as it was about reforming an entire musical culture, obsolete in many ways, that utilized sounds as "dots and lines"²⁸. Challenging the relationship between what the performer saw and what was being played was a key element of this philosophy, for as long as the fabric of his music continued to involve fixed pitches, durations, timbres, and intensities, plasmatic music would remain nothing but a theoretical concept. Therefore, avoiding mechanical gestures triggered by the performer's muscle memory, after having practiced scales, arpeggios, while using steady rhythmic patterns, became imperative. Since the creation of sound plasma involved specific technical steps (fluid textures, unrecognizable sources), it became obvious that a different approach to making music was altogether necessary. During his search for the essence of sound, Rădulescu often asked his performers to "enter into the sound", perhaps in similar ways with Giacinto Scelsi, who he greatly admired. A broad description of all these directions came with the first interview published in Romania, after his return to Bucharest:

It is hard to tell how I reached this point, but I know that through a serious reflection upon the meaning of the musical language, I found myself confronting a number of syntheses. I realized that we cannot write active music anymore – based on actions – and instead, we need to rise to a higher level, towards a music that creates a special state, in which the cause and effect are hidden. For example, by creating sonic phenomenae, you cannot tell what the cello is playing anymore. For this however, you are required to sustain sound in a certain way, so that its intrinsic constitution would become more evident.²⁹

In the relentless quest to imagine and create new sonic textures during the early 1970's, Rădulescu focused on hiding the predictable acoustic properties of instruments by experimenting with a wide range of extended techniques.

Published in 1974, *Capricorn's Nostalgic Crickets* for seven woodwind instruments is among his first large-scale experiments with sound plasma, despite the fact that the term is not specifically mentioned in the score. On the other hand, the use of heterophony and concealing the cause and effect relationship are described. This extensive work may be performed by any ensemble of identical woodwinds, such as seven alto flutes, seven oboes, and so on. The effect of sound plasma is obtained throughout the piece by combining four types of performance techniques: "yellow tremolos" in the high register, created by using different fingerings on the same pitch; "stable multiphonic sounds" in the middle register; "unstable multiphonic sounds"; and "fluttersong and voice" combinations in the lowest registers of the instruments. In order to avoid performing "dots and lines", the composer requested that the appearance and

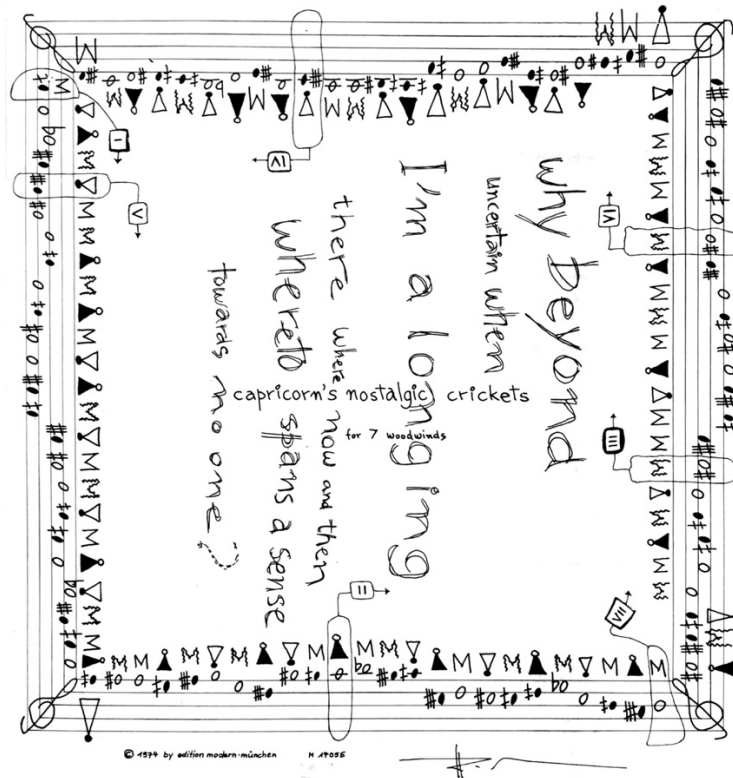
²⁷ Pierre Schaeffer, *Traité des objets musicaux* (Paris, France: Éditions du Seuil, 1966), 93.

²⁸ Horațiu Rădulescu, *Sound Plasma: Music of the Future Sign* (Munich, Edition Modern, 1975).

²⁹ Arzoiu, 149.

disappearance of sounds shouldn't be done in a clear or sudden way. Lastly, to add an expressive dimension, Rădulescu included a poem within the square-shaped score, to be "thought through to its depth" by the performers. In fact, this practice continued with numerous other works composed afterwards.

Fragment from *Capricorn's Nostalgic Crickets*



The intangible dimensions of plasmatic music were perhaps best captured by the publication in 1975 of a symbolic artist statement, resembling something between a utopian manifesto with multiple poetic and philosophical connotations and a pseudo-scientific theory paper. To me, the text also pays an homage to the Dada movement, which also had Romanian roots. Its title, *Sound Plasma – Music of the Future Sign or my D High, Opus 19*, confirms once again the composer's preoccupation with the development of a new type of music during the 1970's. Despite its vague message and occasionally silly tone, Rădulescu's artistic credo comes across quite clearly in the following paragraph:

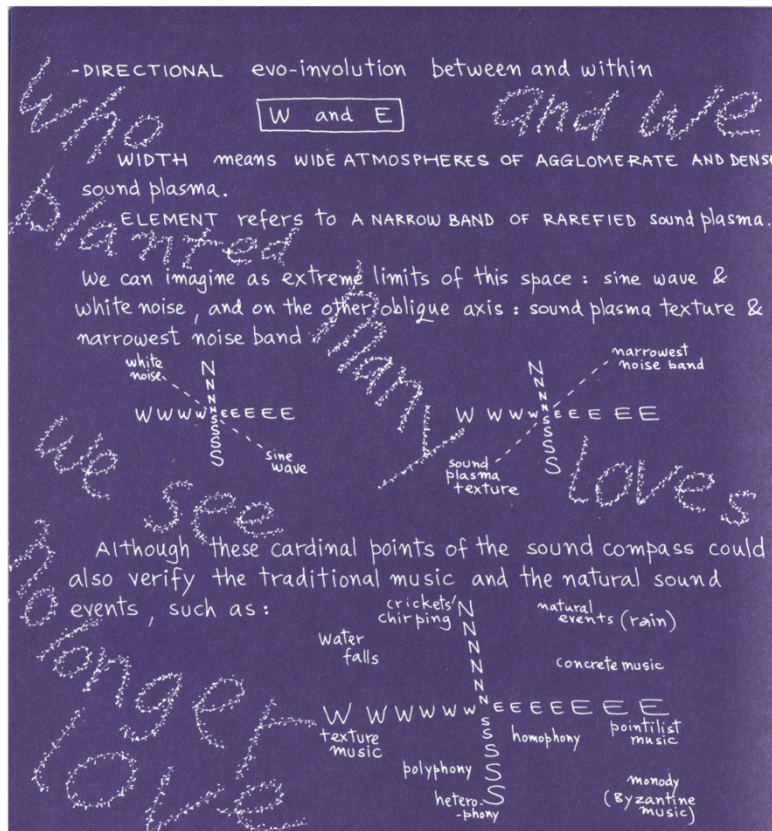
The sound in itself is an endless ocean of vibrations. Although Pythagoras penetrated the secret of these waves, for millennia we made music treating sound from its outside, i.e. combining sounds more or less into monody, homophony, polyphony and heterophony. [...] More recently electronic music contributed significantly to the future image of music by decomposing and recomposing the sound, but even in this field, old formal & aesthetic manias of acting with sounds has dominated.³⁰

Overanalyzing this text would be a mistake. Many thought-provoking statements are made, but viable musical technique is not discussed, and solutions, if any, are nebulous. For the academic

³⁰ Rădulescu, *Sound Plasma*, 3.

reader, this is neither a well-designed composition nor a thorough investigation of plasmatic music. In a discussion with Irish musicologist Bob Gilmore almost three decades later, Rădulescu pointed out its origins and nature: “It’s both a prose composition and a theory text. The text was written more or less in ‘69/’70 and then improved in ’73, and published in ’75 by Edition Modern in Munich.”³¹

Fragment from *Sound Plasma: Music of the Future Sign*



While lacking an overall sense of purpose, the text provides a view of some depth into the composer’s mind and artistic intentions. Throughout the twenty pages of hand-written text and drawings printed on purple paper, a wide panorama of themes and observations unfolds, including sound plasma, heterophony, the cause and effect relationship, nature, meditation, and magic.

Rădulescu’s radical ideas eventually captured the interest of the more adventurous performers and conductors in Europe, who became important catalysts in bringing to fruition his theories on plasmatic music. While the fabric of sound plasma is inherently more complex when a multitude of layers of sound are interwoven, its expression in solo works is also possible. In fact, the challenge of creating sound plasma with a single instrument seemed to embolden Rădulescu’s imagination, eventually leading to the creation of incredibly unique solo works. Two such examples can be found in *Inner Time* and *Das Andere*, composed two years apart.

³¹ Gilmore, *Wild Ocean*, 118.

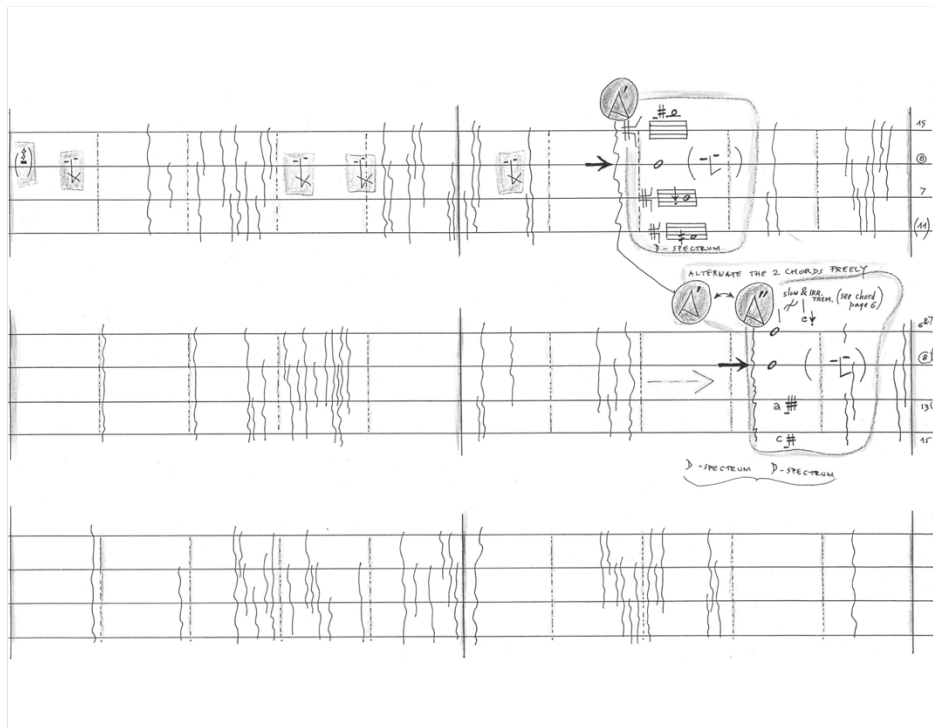
In 1980 Rădulescu returned to Darmstadt, where among the French spectralists he also encountered British clarinetist Roger Heaton. Following a second contact with Heaton at Darmstadt in 1982, he composed *Inner Time* for him, later premiered in London with Rădulescu conducting. A groundbreaking work inspired by Alexander Calder, with a total duration of twenty-eight minutes, the piece requires continuous playing in a fluid manner, involving circular breathing. As a result of the fast motion between alternate fingerings in the ultra-high register of the clarinet, plasmatic clouds of microintervals and multiphonics are continuously formed and dispersed. The overall design of the work resembles a series of undulating lines starting from the highest partials, moving to the lowest register of the instrument, until ultimately returning to the highest register again. As in Calder's mobiles, the curved lines are meant to suggest a sense of motion and fluidity. Throughout the piece there are one hundred and thirty-seven modules which contain fast figurations, of longer durations at the beginning and the end, and more compressed towards the middle of the work. One could hear the unfolding of the piece as a heavily ornamented melodic line, despite the fact that no such melodic drive was probably intended. The notation system is innovative as well. The staves and barlines have been replaced by a graphic system that marks pitch through numeric partials and duration through minutes and seconds. Although rarely performed and virtually unknown by today's mainstream conservatory performers, *Inner Time* remains among the most refreshing works of the 20th century clarinet repertoire.

Another encounter with a prominent performer who was able to wonderfully voice Rădulescu's ideas on sound plasma led to the birth of *Das Andere*, composed in 1984 for French violist Gérard Caussé. Over the years, the work has seen numerous alternative renditions, as in the original score, Rădulescu stated that any string instrument tuned in perfect fifths would be acceptable. The cello version was premiered by Rohan de Saram in 1984, with Corrado Canonici giving the double bass premiere in Bucharest in 1992.

Once again, we recognize the composer's desire to remain in-between, as described in the score: "This music, at the border between score and sound phenomenon, is trying to create a state of trance, close to a spiritism séance where we would invoke our own alter ego or anti-I."³² While circular breathing and the ability to produce fast-moving residual pitches guaranteed a certain amount of amorphous fluidity in *Inner Time*, trying to achieve sound plasma with a solo string instrument was an even more challenging task. The eighteen-minute piece is based on two characters: *alfa*, which involves irregular bowings on all the strings of the instrument, and *sigma*, which is a series of closely related melodic lines played on the high partials. With the *alfa* character, the arpeggiated movements require a great amount of mobility, while with *sigma*, the two melodic lines are always in chasing each other. In the score, the staves and measures have been replaced by four horizontal lines showing the four strings, interrupted by vertical lines marking 10 second segments. The overall design of the work resembles a gradual fall from the highest register of the instrument, towards the lowest open string. The effect of sound plasma is obtained by avoiding and type of regular motion, such as predictable bowing changes, or a steady bow pressure involving constant speeds.

Fragment from *Das Andere*

³² Horațiu Rădulescu, *Das Andere* (Lucero Print, Montreux, 1984).



A particular type of sound plasma occurs when multiple sound icons are involved. In *Clepsydra*, a substantial work written in 1982 for sixteen prepared pianos positioned vertically, moving masses of sound are created by allowing the pianos to resonate freely. Years later, during the 1990's, a renewed interest in writing keyboard works for Ortwin Stürmer turned Rădulescu's attention away from plasmatic music. His second, third, and fourth piano sonatas were written between 1990 and 1993, with his piano concerto, *The Quest*, premiered soon afterwards in 1996 by the Frankfurt Radio Symphony. Two more piano sonatas were written in 2003 and 2007. Due to the tuning and percussive nature of the instrument, the creation of sound plasma was obviously not possible anymore, especially when writing solo piano works. When asked if he was still interested in plasmatic music during the 1990's, Rădulescu stated:

In a way yes, because it's a very vivid matter of sound. It means if you use from the sound spectrum some cells and you change them into fundamentals and you play on them with very rich, or enriched techniques, you make a very timbral and dynamic, very vivid sound. You create a sound plasma.³³

Rădulescu was able to achieve a richer and more sophisticated form of sound plasma by mixing winds, string instruments, and pre-recorded sounds, as can be found in *Khufu's Serpent V*, a chamber work premiered at the Warsaw Autumn in 2003. The overall architecture of this eighteen-minute piece resembles a canon, with all the instruments beginning and ending at the same time. The stage setup requires a circular placement of the seven players in the ensemble, with the audience in the middle.

³³ Gilmore, *Wild Ocean*, 118-119.

Fragment from *Khufu's Serpent V*

Although the notation system looks traditional, with clefs, staves, and measure numbers, the performers are allowed to choose the moment when they start performing within every measure, as long as inside these sound blocks they play 80% of the time. The duration of individual measures changes constantly between five, eight, thirteen, and twenty-one seconds – numbers evidently derived from the Fibonacci series – with a few measures lasting as long as thirty-four or even fifty-five seconds. As in so many other works, the composer maintains a mystical connection with nature, with these ninety-six sonic eruptions imagined as young and old trees growing in a strange forest. The work is based on four types of textures, which are constantly recombined:

1. stable chords, rich in harmonics, based on the pitches marked in the score

2. tremolos between the same pitches (which Rădulescu calls “yellow tremolos”), created by using alternate fingerings in the winds or two different strings

3. fluttertongued sounds, produced vocally, or similar effects created through an unsteady tremolo in the strings

4. spectral scales based on the overtone series, starting from a specific pitch, and repeated with tempo variations

By alternating between these performance techniques and providing a certain amount of freedom for the players, a vivid form of sound plasma is created, not only involving a constant motion between textures but also a fluid type of spatialized sound.

Perhaps the most intriguing and certainly intangible dimension of plasmatic music stems from Rădulescu’s extensive use of compositional techniques that employ sum and difference tones. As was the case with the theory of musical syntaxes, heterophony, and acousmatic music, the concept of resultant tones was not at all new when he began discussing it and eventually wrote about it. In 2001, I attended one of his elaborate lectures on this topic at the National University of Music in Bucharest, which as expected, led to heated discussions and ultimately raised many questions on its relevance. The very same questions we asked have been raised numerous times before. Throughout the eighteen and nineteen centuries, various musicians and physicists investigated the Tartini tone effect, which appears when two sounds with a steady pitch and a high enough amplitude are played together. Due to the non-linearity of the inner ear, a third and fourth sound may be perceived, at pitches that can be easily determined by adding and subtracting the two original frequencies. While it is generally agreed that the structure of the inner ear causes this auditory illusion, various theories that regard the sum and difference tones as a neural phenomenon have also been proposed at times. One would have expected Rădulescu to elaborate on this topic in his lengthy article on the subject of brain and sound resonance, written after decades of experiments and reflection.³⁴ Unfortunately, throughout more than forty pages of text and score excerpts, he focused his attention on discussing his works, as opposed to exploring the topic itself. Regardless of what causes the appearance of resultant tones in music, we know that their manifestation is rather peculiar, usually more effective with wind instruments, and generally requiring very specific acoustic conditions. Once again, for resultant tones to be perceived, the production of steady pitches at high volumes remain two essential ingredients in the acoustic mix, which is not always the case in Rădulescu’s music.

Ironically, the very illusory nature of the sum and difference tones is an important ingredient in the creation of sound plasma. Although hard to distinguish by the average listener and in many cases by professional musicians as well, resultant tones can be often perceived in his works, including *Capricorn’s Nostalgic Crickets*, *Das Andere*, *Khufu’s Serpent V*, or his fifth string quartet, entitled *Before the Universe was Born*, and completed in 1995. When moving textures are involved, these resultant tones can create a very rich sonic aura, designed to greatly enhance the auditory experience. The intangible dimension of this acoustic effect – as these pitches cannot be captured by a spectrogram for the simple reason that they actually do not exist

³⁴ Horațiu Rădulescu, “Brain and Sound Resonance; The World of Self-Generative Functions as a Basis of the Spectral Language of Music”, in *Annals of the New York Academy of Sciences*, (New York, 2003, 999), pp 322-363.

– is perhaps one of the main reasons his music will always have a more powerful impact when experienced live.

Very little has been written about Rădulescu's Romanian sources of inspiration. Despite being unable to return to his homeland for more than two decades, he never severed his cultural roots. On the surface, we see the Romanian titles and occasional references to the timeless traditions and music of the village, particularly folk songs and Christmas carols. At the deeper level, and these dimensions will likely remain intangible for the western mindset, there is a different sense of timing, as well as a world of ancient rituals and outlandish sonorities. This is, essentially, the Romanian ethos. Unless one is familiar with the folk culture of Eastern Europe, a certain enigmatic aura will continue to surround his music. Yet, what may sound as mysterious or exotic music, is a reflection of a rich world of archetypes and symbols that has thrived in Romania for centuries.

The temporality of Rădulescu's music is intimately bonded with the primordial traditions of the Carpathian Mountains, where musicians and artists still preserve a mystical relationship with nature. In these lands, far away from clock towers and watch stores, the flow of time seems to have no discrete segments, as village life revolves around the much longer cycles of birth and death, the change of seasons, or transhumance. With expectations and goals losing their significance, a different sense of time exists for Carpathian shepherds and Rădulescu alike. This is archetypal time, captured in a refreshing way, ancestral and new at the same time. While plasmatic music has cyclical features, it is essentially non-directional, non-cadential, and anti-climactic. Sound plasma requires a substantial amount of time to unfold, and we, the listeners, need an equally substantial amount of time to discern and reflect upon its richness. This is why his works defy standard concert expectations, even for the already open mindset of the twentieth-century listener.

Additionally there are the sounds of ancient folk instruments, particularly the *bucium* or *tulnic*, more commonly known as the alphorn in the west. In Romanian, the word is derived from the Latin *bucinum*, originally meaning curved horn. For centuries, from the Transylvanian to the Swiss Alps, this primordial instrument constructed of limetree bark or wood was used for communication in mountainous areas. During peacetime, calls on the *bucium* were made to guide sheep and dogs, signal a wedding or death, while during wartime they were designed to guide defending armies. Across the Carpathian mountains, most performances on the *bucium* consist of repeating arpeggiated figures between the second and the ninth partials, with an emphasis on the fifth, sixth and the seventh. A particularly unusual type of heterophony occurs when two or more instruments are played at the same time, during holidays or local celebrations in mountain villages. As these instruments are not perfectly tuned, acoustic beats and small tremolos occur on the fundamental and lower partials.

Although the use of wind instruments may be seen as closer in spirit to the sound of the *bucium* ensembles, similar textures appear in *Das Andere* (where the sound of the alphorn is in fact mentioned in the score) or in the *String Quartet No. 4*, subtitled *infinite to be cannot be infinite, infinite anti-be could be infinite*, composed for nine string quartets between 1976 and 1987. Other examples of sound plasma inspired by the *bucium* can be found in *Sensual Sky* for nine musicians and tape, composed in 1985. In this work, various sonic colors are obtained through clusters of notes “hung” on an undulating axis. Through micro-tonal changes of tuning in one or more strings, Rădulescu sought to obtain an effect which he called “virtual spectral scordatura”. *Bucium*-like sounds intertwined in fluid textures were also employed in *Byzantine Prayer* opus 74, written for forty flutists with seventy-two flutes in 1988, after the death of

Giacinto Scelsi. In this work, the forty performers are arranged in eight concentric groups using spatialization techniques.

Rădulescu's music is also mysteriously linked with a small and isolated region in Romania. Positioned in northern Transylvania, *Maramureș* is a remote valley partially enclosed by mountains, inhabited mostly by Romanians, in addition to a few Hungarian communities. For centuries, the area was heavily forested, with mountain passes connecting *Maramureș* with the surrounding areas hardly accessible in the winter. Since the region was mostly isolated from trading routes, wars, and foreign influences, its music has retained an original flavor until the present days. As in other Romanian provinces, the name of the typical folk band is *taraf*. Throughout *Maramureș* though, the way the instruments are played is slightly different. Most folk groups include a violin called *ceteră*, occasionally accompanied by a second one, *contră*, as well as a *zongoră* (a guitar held vertically), and a *gordună* (a smaller contrabass). The tuning of the guitar is particularly unusual, with either two strings on D and A, three strings on D, A, and D, or four, tuned on A, C, A and E. This type of tuning is obviously designed for fast and loud playing using only few chords, as opposed to the traditional guitar tuning, which allows more complex harmonic progressions.

There are many elements that set the music of *Maramureș* apart from the rest of Romania. In certain villages, the violin is played very high, with double stops that often emphasize frequencies derived from the overtone series. These are not harmonics, but rather, regular pitches creating a very raw and coarse type of heterophony. In addition to this unusual way of playing, women and men sing very high as well, with even higher-pitched shouts and whistles called *țipurituri* being occasionally produced by the remaining musicians or dancers. Underneath, the guitar produces very simple chord progressions, which often don't seem to follow an identifiable metric pattern.

In the music of the *bucium* players and *Maramureș* bands, chord progressions defy expectations, cadences vanish, and melodies appear and unfold unexpectedly. The sound of the *bucium* was well-known to Rădulescu from his years in Bucharest, with his interest in imitating it being expressed in his brief discussions with Nemescu during the late 1960's. Although I could not find a record of him mentioning the *Maramureș* bands and the high-pitched effect of *țipurituri*, this unique sound world must have remained with him even after leaving Romania, even if only subconsciously. The same kind of textures and sound effects are present in *Capricorn's Nostalgic Crickets*, *Das Andere*, as well as in *Inner Time II*, Op. 42, written for seven B flat clarinets in 1993, and dedicated to Calder.

Horațiu Rădulescu's world of ideas is equally fascinating and nebulous, for which reason describing it in all its complexity and richness remains a problematic task. The best writings on his music have come from those who could appreciate his works and not from the composer himself. In fact, the sonic realization of these ideas is in my opinion much more convincing than the theories themselves, with a number of works reaching the heights of true masterpieces. In the absence of a substantial theoretical study on plasmatic music from the composer himself, the question of how to best define sound plasma is an essential one. In the quest to quantify its multiple dimensions, some of them intangible, five overarching characteristics can be observed:

1. Starting with a thorough understanding of heterophony, Rădulescu quickly sought to move away from his Romanian contemporaries and ultimately create an intermediary musical syntax.

2. Plasmatic music, as with acousmatic music, aims to challenge notated instrumental music's cause and effect relationship, usually through new types of notation, the use of extended techniques, improvisation, or poetic suggestions.
3. Sound plasma entails sonic continuity, in clear opposition with the western tradition of music that uses sounds as "dots and lines"; generally, the attack and decay segments of the sound envelope are blurred or greatly extended, ultimately leading to a type of music that evolves gradually.
4. Although often indistinguishable, sound plasma involves sum and difference tones
5. The fabric of plasmatic music is derived from the natural properties of sound, particularly the overtone series.

One could still claim that sound plasma is nothing more than heterophony. Yet many of its specific characteristics provide a strong argument against such a viewpoint. While heterophony involves the desynchronized multiplication of a melodic source, sound plasma is a much more complex phenomenon, with a source that is neither melodic nor easily identifiable. Sound plasma is meant to be at least in a continuous state of fluidity, if not a completely volatile type of music matter, so to speak. Secondly, hiding the cause and effect relationship by avoiding "dots and lines", a topic of great interest for Rădulescu, is not a feature of heterophony. While there may be some overlapping with heterophony, where the melodic source is blurred by its own multiplications, in sound plasma hiding the source has much broader implications, pertaining to the visual aspect, pitch, duration, spatialization, and especially timbre. Lastly, the use of performance techniques involving sum and difference tones, even if controversial, remains an important component of plasmatic music. While Rădulescu grew up in the Romanian heterophonic school, he grew out of it as soon as he left Bucharest.

In cases where a large number of instruments or pre-recorded layers are involved, plasmatic music shares common features with sound mass music. This is not accidental, as the discussion on the differences between heterophony and sound mass occurred quite often in Niculescu's circle at the Bucharest Conservatory. Yet the fabric of plasmatic music is much more refined than in most types of sound mass music, as sound plasma is inherently tuned, and in some form of harmony with itself. Regardless of labels and parallels, under the semantic umbrella of plasmatic music we find a wide range of new and unique musical textures with strong archetypal roots. While sound plasma may not become that fifth syntactic category, I favor Rădulescu's view that its place is somewhere in-between the other four, by borrowing a bit from each one of them.

At first sight, the neophyte may be tempted to discard Rădulescu's theories and sonic experiments as utopian. Broad performing forces and devices are often called for, in works that can be rarely performed in established concert series, due to their extensive length. His scores involve original notation symbols that can be challenging to decipher even by the most devoted performers. Furthermore, the development of plasmatic music has had a limited impact on Horațiu Rădulescu's contemporaries and the more recent generations of composers, likely because his ideas and ideals have yet to find a fertile ground in the academic world. Rădulescu was a dreamer, and dreaming is often frowned upon in the academia. Today, there is no

plasmatic school of thought, or a unified group of composers further advancing this notion. Unlike Messiaen or Murail, he did not dedicate a considerable amount of his time to teaching.

Lastly, although being proud of Romania's contributions to the development of spectralism, a few composers from Rădulescu's generation continue to remain quite guarded about his music, not necessarily because of its aesthetic value, but more likely because of his controversial statements. Despite his humor and colorful personality, he was often outspoken when it came to new music affairs, as noted by Bob Gilmore: "About his own generation, it is probably best not to quote him."³⁵ It often seems that Rădulescu's statements on music and his contemporaries weigh a lot more than his entire catalogue of works, so to speak, for which reason my own queries and lectures on his music have been received with skepticism by the Romanian public. For example, although he disliked being regarded as a spectralist, Rădulescu often claimed that he invented it: "I don't like this label, even though in 1969 I invented spectral music, a synthesis of the Byzantines, the Hindus, sound itself, and nature."³⁶ Statements like these became more problematic after the Iron Curtain fell, when a clearer image of what happened in Romania during the 1960's didn't take long to crystalize. In a comprehensive article published in 1997 for example, Romanian-born composer Horia Şurianu discussed the early spectral works of Corneliu Cezar and Octavian Nemescu, written as much as five years before *Credo* was conceived.³⁷ Following a lengthy discussion with Şurianu in Paris in May 2011, I had the opportunity myself to shed further light on the early days of Romanian spectralism, during a spectral panel presented at the 2011 European Musical Analysis Conference, hosted by the Santa Cecilia Conservatory in Rome. Before and after me, other writers touched upon these issues as well, both in Romania and abroad. Rădulescu was indeed one of the pioneers of spectralism, but he was not the one who invented it; sound plasma he did invent, however.

While featuring many intangible dimensions, plasmatic music is not a mysterious phenomenon. For performers, working with sound plasma requires effort and skill, as well as an interest in moving beyond mainstream conservatory training. For listeners, a liberated mindset is paramount. By questioning old habits and crossing boundaries, refreshing sonic territories have been discovered, and with them a fascinating world of acoustic possibilities emerged. With the arrival of more advanced technologies, especially live processing and spatialization, plasmatic music will likely continue to flourish and ultimately gain new dimensions.

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³⁶ Krafft, 47.

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