Musicae Scientiae
Discussion Forum 3, 125-140

Resituating the spectral revolution: French antecedents and the dialectic of discontinuity and continuity in Debussy's *Jeux*

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Situating the dialectic between discontinuity and continuity in twentieth-century music primarily with Germans from Wagner through Schoenberg to Darmstadt composers is an error. Certainly, as Michel Imberty and Nadia Capogreco have noted, *Parsifal* opened new horizons with its unusual silences and its composition in blocks. But so did Gossec a hundred years earlier with his famous *Marche lugubre*, a work revived and often performed in popular contexts at the turn of the twentieth century, and Stravinsky in many of his early works. As Antonio Lai points out, serial and post-serial music prioritized the discontinuous over the continuous. However, there were also precedents to this in France, and a French response well before spectral composition of the 1970s. In this article, I place the achievements of spectral music as part of a cumulative development, as Lai proposes, but one rooted in the French interest in perception and continuous with French values, especially Bergson's notion of duration.

I.
Earlier research on perception, sound, and timbre

Roots of our current "era of timbre" and interest in the nature of sound and musical perception go back many years. Since the seventeenth century, an important current of French intellectual thought has been belief in a mechanical connection between music and the body. While Descartes argued this from a philosophical perspective, Marin Mersenne in his acoustical studies and later Joseph Louis Roger in his treatise on the effects of music on the body promoted sound as an object of research[1]. In the nineteenth century came renewed interest in perception and physiopsychology, first

(1) See Marin Mersenne, *Harmonie universelle* (1636), Joseph Louis Roger, *Traité des effets de la musique sur le corps humain* (1748). Also Kate van Orden (2002), "Descartes on Musical Training and the Body", in *Music, Sensation, and Sensuality*, ed. Linda Austern. New York: Routledge, chapter 1.

in the visual domain. Just as Gérard Grisey and other spectral composers have sought help from contemporary acoustic theory and computer technology in understanding the microscopic aspects of perception, impressionist and post-impressionist painters looked to positivist studies of perception begun in the 1860s. Taine and Littré, among others, focused on sensations — the effect that objects make on sense organs — for their empirical research. They believed that impressions (a synonym for sensations) were primordial, the embryos of one's knowledge of self and the world and, significantly, a product of the interaction between subject and object. Like them, the painters dubbed "Impressionists" believed that any art based on impressions had the capacity to synthesize subject and object. Impressions were not ends in themselves, but the means to new experiences of reality.

Whereas today the word "impressionism" is pejorative, perhaps associated with the desire of the middle-class to share in the lifestyle of the old aristocracy, in the 1870s and 1880s the movement referred to the avant-garde artists who responded to these studies and theories[2]. Establishing a precedent for many in the twentieth century, they rejected the use of imposing forms and concentrated on the immediacy of perception, hoping to use art to reveal the deep intuitions of the unconscious. Impressionists believed that the way images and sounds are produced affects their perception. Responding to physicists' breakdown of the visual spectrum into what was assumed to be characteristic of unreflective vision, that is, the vibrations of colour and light, these painters simplified their palettes by using only colours of the prism, replaced light and dark oppositions with a new concept of visual harmony, and created mosaics of distinct rather than blended colours and forms. Instead of working from line to colour, artists like Cézanne conceived painting in terms of colour relationships, line and form being secondary to juxtapositions of colour and light. Critics considered this a "physiological revolution of the human eye", an attempt to render visual experiences more alive, more perceptive of nuances.

Visual and aural perceptions were understood to share some important elements. In 1883 Jules Laforgue compared the kind of vision elicited by impressionist paintings to aural experiences in which "the ear easily analyzes harmonics like an auditory prism". Directly inspired by Helmholtz's theory of harmonics, the physicist Charles Henry later proposed a colour spectrum in a "chromatic circle" that directly related visual to aural perception. The goal of his analysis was to help artists intensify the viewer's sensory perception through the systematic juxtaposition of contrasting colours. Henry believed that perception would be dynamic to the extent that, responding to the tension of opposites, the eyes move back and forth rapidly between discontinuous, contrasting colour fields (*e.g.* red and green)[3]. As an interest

(2) This article borrows from Jann Pasler (2001) "Impressionism," in *The New Grove Dictionary of Music and Musicians*, 2nd ed., eds. Stanley Sadie and John Tyrrell. London: Macmillan.

(3) See Charles Henry, *Introduction à une esthétique scientifique* (Paris, 1885); *Cercle chromatique: présentant tous les compléments et toutes les harmonies de couleurs avec une introduction sur la*

in optics and Henry's colour theory grew, the more scientifically-minded Neo-Impressionists of the late 1880s, such as Signac and Seurat, focused on the physics of coloured vibrations *per se*. Applying principles derived from Henry's theories, they broke colours down into their constituent elements and used contrasts to create visual harmony. They were also interested in the effect of the artist's nervous system on the nature of the impressions and wished to elicit specific "correspondences" for emotional states. These preoccupations paved the way for early experiments with anti-naturalistic flat surfaces made of juxtaposed colours by Post-Impressionists like Matisse.

Similar issues were associated with late nineteenth-century music deemed impressionist. Wagner's nature music, especially his "Forest Murmurs" from the *Rheingold* and vaporous moments in *Parsifal* and *Tristan*, elicited vague references to musical impressionism, but it was Debussy who extended these ideas and had a lasting impact on the future of music. His *Printemps*, an evocation of the "slow and arduous birth of things in nature", parallels not only the painters' turn to "open air" subjects, but also their exploration of unusual colours and mosaic-like designs[4]. Like Impressionist painters, he sought artistic equivalents for water, fountains, fog, clouds, and the night, substituting sequences of major seconds, unresolved chords, and other sound-colours for precise designs, solid, clear forms, and logical developments. In *Prélude à l'après-midi d'un faune* and subsequent pieces, Debussy increasingly emphasized distinct sound-colours, those produced by individual instruments, rather than the composite ones of chamber or orchestral ensembles.

In part because of the unusual sounds heard during the Universal Exhibitions, an interest in primitive cultures and nature also led the French to reconsider Western notions of timbre. The various "musical promenades" published in the press, and especially Debussy's focus on the timbre of Annamite instruments, have been well-studied. Far less-known is a series of articles published during the final month of the 1889 Exhibition by the mystic writer and composer Edmund Bailly and called, "The World of Sound" subtitled "Sound, harmony of the spheres, voices of nature" (Bailly, 1889). The first began with an acoustician's definition of sound as "movement that becomes audible at a distance. Every sound, every noise announces a movement". Movement, in turn, also creates sound, even "the projection of light across space". Writing eighty years before John Cage, Bailly observes, the complete absence of any

théorie générale du contraste, du rythme et de la mesure (Paris, 1888); *Harmonies de formes et de couleurs. Démonstrations pratiques avec le rapporteur esthétique et le cercle chromatique* (Paris, 1891); and also his publications on music during this period, *Wronski et l'esthétique musicale* (Paris, 1887) and *La théorie de Rameau sur la musique* (Paris, 1887).

(4) Gounod, as secretary of the Académie des Beaux-Arts, used the word "impressionism" in 1887 to attack *Printemps*, Debussy's envoi from Rome. Besides having an exaggerated sense of musical colour, the work questioned the authority of their values. Its "impressionism" seemed "one of the most dangerous enemies of truth in art".

sound does not exist on our planet any more than radical darkness or absolute cold". There are "microscopic ambient sounds" everywhere — ranging from the planetary ones evoked by Greek philosophers to those made by the earth, animals, and even plants. Studying references to sound in essays written by travellers to Africa, Oceania, and the South Pole, Bailly was led to thinking about sound in all its variety and effect on the human listener[5].

Just as contemporary physics informed new ideas about painting, Helmholtz's acoustics and developments in the spectral analysis of sound fed composers' interest in musical resonance and the dissolution of form by vibrations (which was compared to dreams and deep intuitions). In much of Debussy's music, as in impressionist pieces by Ravel and others, the composer arrests movement on ninth and other added-note chords not to produce dissonant tension, but, as Dukas puts it, to "make multiple resonances vibrate". This attention to distant overtones, particularly generated by gong-like lower bass notes, produces a new sense of musical space, in effect one giving a greater sense of the reality of sound. Using a wide range of dynamic and registral sounds — a complete scale of nuances — such music can effect subtle vibrations in the listener's nervous system. In one of his earliest essays (1899), Emile Vuillermoz reiterates Laforgue's concerns with the problems of line and fixed forms and, sounding like a Neo-Impressionist, suggests that "the progressive refinement of our nerves [by this music] leads us to think that this is the path of musical progress" (Vuillermoz, 1899, pp. 1-6).

In many ways, the spectral composers of the 1970s have continued to explore related research trajectories. As for the Impressionists, Grisey's music, Hugues Dufourt explains, "is a movement of back and forth between sensation and object"[6]. The work is meant to "intensify or sharpen our sensations by situating them on another scale" than that to which we are accustomed. Grisey does this by focusing on an instant, dilating the sound spectrum of a micro-second, in a way as Monet freezes a moment of time to decompose its light. Like Seurat who used a pointillist technique to build form with tiny dots of juxtaposed colours, Tristan Murail works by additive synthesis. As Dufourt explains it, he fragments the diverse elements of a process whose parts operate in opposing pairs. In deconstructing paint and sound at the micro-level, these artists alter the nature of aesthetic perception.

(5) The very month his series on sound ended, Bailly formed a journal and publishing house to support occultist and symbolist work, the Librairie de l'art indépendant. The salon he held in its office attracted some of the leading symbolists of the time, including Debussy, a regular there from 1890 to 1894. During this period, Bailly distributed Debussy's *Cinq Poèmes de Baudelaire* when it was first published and his Librairie de l'art indépendant published Debussy's *Damoiselle élue* in a limited luxury edition. In this context, Debussy developed a new theory about music. Connecting sensations associated with exotic music, symbolism, and the occult, he proposed that music should express "the mysterious correspondences between nature and the imagination".

(6) All references to the essays in this volume will be to the author's name only.

With a similar attitude toward sound and the benefit of computer analysis, spectralists have also revisited the dynamic nature of musical acoustics, the structure of musical resonance, and the use of timbre to rethink one's musical vocabulary and syntax. In 1974-1985, Grisey studied acoustics with E. Leipp at the University of Paris VI and began a cycle exploring the acoustic properties of sound and human perception, "Acoustic spaces" (1974-85)[7]. Like Debussy and Bailly, Grisey did not consider musical parameters as distinct. While Debussy treated quick rhythmic patterns as an element of timbre, especially the superimposed polyrhythms in "Sirènes" from *Nocturnes*, Grisey conversely explored the pulse inherent in certain timbres. Both have blurred the difference between single sounds and chordal sounds (*e.g.* the parallel chords of *Canope*) and between vocally produced timbre and instrumental timbre (*Pelléas et Mélisande*, "Sirènes," and Grisey's *Quatre chants pour franchir le seuil*) and both sought new ways to envisage timbral succession. Both have conceived of sound as a living organism, perpetually waxing and waning, although not always in accordance with acoustic principles (*i.e.* Debussy liked to use short crescendos that break off at their zenith while Grisey focuses on the moment of attack and subsequent demise of sound). Still, if nineteenth-century research centred on discovering the normative characteristics of sound and colour perception, the spectralists, Dufourt observes, have found valuable information in the "irregularities and deviations" of sounds. For them musical sound can include not only noises of all sorts — which fascinated Bailly and later composers of *musique concrète* — but also inharmonic sounds and filters. Using computers, spectralists have come to redefine what is primary in our perception of sound as the timbre that results from an interrelationship among several acoustic indices. Manipulating these in their compositions has resulted in what Grisey called perceptual "hybrids".

Some of today's French composers have moved beyond traditional acoustics, physics, and psychophysiology, and Grisey, along with others, has realized that the best art is not applied science. Still, perceptual research has been important to their development. The French focus on perception has kept the music made in response to it rooted in hearing and in the effect of sounds on listeners rather than in mathematical concepts or idealistic notions of how hearing might evolve as Schoenberg and his followers may have assumed in writing serial music. Incorporating the insights of computer technology, spectralists have pushed on limits of what is possible while maintaining a connection to the physicality of sound.

(7) For a discussion of this work, see Julian Anderson (2001), "Gérard Grisey", in *The New Grove Dictionary of Music and Musicians*, 2nd ed., eds. Stanley Sadie and John Tyrrell. London: Macmillan.

II.
Bergson, discontinuity and continuity

From Grisey's perspective, even more primary than the sound spectrum in the experience of music is the process that the philosopher Henri Bergson called "duration". Bergson used this concept to distinguish the time of the unconscious and dreams, characterized by the interpenetration of heterogeneous elements, from time as space, like the minutes of the ticking clock whose measurement divides time into homogeneous parts[8]. Duration is "the development of a thought that gradually changes as it take shape" (Bergson, 1970, p. 783). In music, it concerns the dynamic aspects that unfold in time, not the stabilizing ones often associated with traditional form. Whereas Bergson saw in the idea of a melody an example of the way the unconscious perceives this kind of time — "a succession of qualitative changes which melt into and permeate one another [...] like the notes of a tune" (Bergson, 1910, p. 104) — Grisey's great accomplishment, as Imberty puts it, was to "dilate the moment to perceive its duration and thus reconquer continuity within the world of sound".

This statement implies that a sense of duration and continuity had been lost in music. Imberty and Dufourt suggest that the post-serial avant-garde was responsible for an aesthetic of absolute discontinuity, causing one of the greatest crises in the history of Western music. However, one does not have to wait until the 1950s to find motivation for exploring discontinuity in music nor the 1970s for a musical response to the "intuition of dynamic continuity" conceptualized by Bergson. At the end of the nineteenth century, not only Bergson and French composers, but also much of French society were becoming increasingly frustrated with Darwinian concepts of organic growth. Many objected to a "mechanistic" view of evolution that involves only transitions and variations of degree rather than kind. Republicans espoused the idea that people, through education and reason, can adapt and change, but their theories of monogenist evolution (the idea that all races descended from one) were increasingly challenged by polygenists who espoused a separate origin for each human race. The latter thought that variations between human populations (and anything they produced) reflected distinct racial characteristics. Polygenists like Gustave Le Bon considered the nature of a people — its soul, forms of thought, logic, and character — as fixed and homogeneous, inalterable by education or intelligence. With problems in attempting to impose French institutions in Indochina, the French were also increasingly divided over the notion of assimilation that pointed to the potential of the environment to influence people, especially

(8) Translating this into Hegelian terms, Imberty see this as the difference between pure being and abstract thought. He proposes that, in music, time as duration is like the time experienced by the listener whereas time as space is the time of the score, "rigid and rationalized by the categories of intelligence and abstract thought".

those in the lower classes or the colonies. After 1900, those interested in racial, social, and political coexistence without assimilation and a colonial policy based on association, or gaining cooperation and participation by native peoples in their own administration, education, and defence, had an increasing influence on French discourse.

Science, early photography, and cinematography also forced reconsideration of assumed continuities as well as an acknowledgement of discontinuity in our perception of reality. In 1900 Planck showed that even radiant energy did not proceed in a continuous flow, but rather was emitted and absorbed in integral quantities, or pockets, and was therefore discontinuous. This was contrary to the causal relationships of nature espoused since Newton and Leibniz. The invention of photography provided a way to freeze motion and spontaneity, capturing "instantaneous" moments too rapid for the eye. Cinema exposed the important role of the temporal process in one's visual perception. For Bergson, however, the cinematic way of thinking was artificial, one of the many fictions of the mind, since it conveyed what is actually changing as a series of distinct forms. In his *Creative Evolution*, Bergson came down hard on what he considered the cinematographic nature of perception as well as conceptual thought.

These ideas had significant implications for those working in the temporal arts and led to an interest in Bergson's philosophy and method (intuition)[9]. His notion of duration helped composers reconceptualize musical continuity in ways that do not rely on the perpetual motivic development and teleological motion of nineteenth-century romantic music. Cinematography, as discussed by Bergson, drew attention to the process of constructing form and to a formal freedom that escaped the constraints of traditional practices. This led to thinking of any motion between distinct entities as cinematic. Cinematography also helped composers reconceive discontinuity without denying or obliterating temporality, and experiment with juxtapositions that bring the perceiver closer to the abruptness of the creative process[10]. In 1913 Debussy acknowledged this when he commented on "the cinematography of instants through which the author moved while he was composing his piece" (Debussy, 1971, p. 242)[11]. In some ways, this focus on new kinds of continuity and

(9) See Julian Benda (1912). *Le Bergsonisme ou le philosophie de la mobilité.* Paris: Mercure de France. In this text, Benda argues that the intuitive method elevates feeling over ideas, the feminine over the virile, the musical over the plastic arts, and the spirit that seeks over that which possesses (p. 59).

(10) See Shattuck (1955), *The Banquet Years.* New York: Vintage. Shattuck devotes a chapter to the use and meaning of juxtaposition.

(11) In his essay, "Matière et timbre". *Revue musicale* (1 April 1921), about the "metaphysical relationships of music with our consciousness", the composer Alfredo Casella pointed to the "close affinities" of "free, bare, and voluptuous sonorities, extra-rapid in their cinematographic mobility", with "the ultimate refinements of our civilization" (40). See also Charbonnel, "La musique et la renaissance de l'inconscient", *Mercure musical* (15 February 1909).

discontinuity in music contributed to what one might see as a reversal in the traditional relationship between structure and process at the heart of modernist music in early twentieth-century France, or, as Imberty and Capogreco put it, the perceptual shift from "categorization" to "incessant accommodation to the process of continuous transformation".

For Bergson's successor Jankélévitch, Gabriel Fauré was the "true Bergsonian" composer. In works such as the "Sanctus" from his *Requiem* and the Berceuse from his *Dolly* suite, Jankélévitch finds the "continuity of becoming [*devenir*]" in the "melody of internal life". The musical equivalent for water in his music is a "vehicle of becoming". While he finds the temporality of Fauré's music inspiring confidence in a future, the aspects of "becoming" in Debussy's music, by contrast, seem to Jankélévitch to lead to "an impasse, a dead-end" with his melody, as in the Prelude from *Pour le piano*, often reduced to a "rhythmic formula" (Jankélévitch, 1976, pp. 99, 118).

Why then, in a 1910 interview, did Bergson confess he had an "intuitive predilection" for the music of Debussy and, for this reason, can one see it as a precedent for the music of Grisey? Bergson's description of Debussy's music as "a music of duration because of the use of a continuous melody that accompanies and expresses the unique and uninterrupted current of dramatic emotion" sounds like Wagner's unending melody (Aimel, 1910, in Bergson, 1972, p. 844). Debussy himself once claimed, "all my music tries to be nothing but melody" (Gervais, 1958, p. 23)[12]. To understand how his music can be Bergsonian, however, we should not look to his individual melodies, for these can lead to the impasse Jankélévitch observed. Instead we should examine his musical form. Jean Barraqué has pointed out how the "sonorous becoming" of *La mer*, especially in "De l'aube à midi," results from a "developmental process in which the very notions of exposition and development coexist" (Barraqué, 1962, 1992, pp. 182, 184). With short motives as building blocks in such works as *Jeux* (1913), I would argue, Debussy goes further, shifting attention to the movement of large segments of music. These segments succeed one another like Bergson's "musical phrase that is constantly on the point of ending and constantly altered in its totality by the addition of some new note". It is the succession of sections that "may be compared to a living being whose parts, although distinct, permeate one another" and whose "mutual penetration, an interconnection and organization of elements" resembles the process Bergson called duration (Bergson, 1910, pp. 104-6). In 1914, when Bergson was "the philosopher of our time" and Debussy "the musician", Debussy's friend Louis Laloy went so far to claim that such a music could not have been produced except in the same environment as such a philosophy and vice versa[13].

(12) In a letter to Vallas from Vienna, cited in Françoise Gervais (1958), "La notion d'arabesque chez Debussy", *Revue musicale*, 241, p. 23.

(13) Louis Laloy, "La musique chez soi, M. Henri Bergson et la musique". *Comoedia* (c. February-March 1914); copy provided to the author by Vincent Laloy.

III.
DEBUSSY'S *JEUX*

To understand *Jeux* as an expression of Bergson's duration, the schemas of abstract thought (which, Bergson points out, "operate in the realm of the immobile") are less useful than Bergson's intuitive method. It focuses on the nature of mobility (Bergson, 1970, p. 1412). As Gilles Deleuze explains, this method involves three stages: the stating and therefore creating of problems, the discovery of genuine differences in kind, and the apprehension of real time (Deleuze, 1991).

STATING THE PROBLEM

Debussy was preoccupied with movement. In his youth, particularly when writing *Pelléas et Mélisande*, he expressed interest in translating into music the "lyric movements of the soul" and the "capriciousness of dreams". Moreover, inspired by the time of nature and of the universe, he did not wish his music to capture just one instant, as a painting or piece of sculpture might. Musicians, he once wrote, have the privilege of being able to "capture all the poetry of night and day, of the earth and sky, and recreate their atmosphere and give rhythm to their immense pulsations" (Debussy, 1971, p. 249)[14]. These attitudes raised important questions about musical form and led him to assert in 1907, the same year Bergson published *Creative Evolution*, that "Music is not, in its essence, a thing which can flow within a rigorous and traditional form. It is *de couleurs et de temps rythmés*" (Debussy, 1927, p. 55)[15].

In my previous work on *Jeux*, I suggest that not only is this a new definition of form in terms of timbre and time, replacing traditional thematic development and functional harmony. If we read *rythmés* as modifying both *temps* and *couleurs*, it also implies that form is the "rhythmization" of sections, each with their own "colour and sense of time" (Pasler, 1982, p. 72). Such a statement makes the temporal dimension primary in the creation and perception of form. In *Jeux*, I argue, the successive volleys of a tennis game and the ever-changing relationships between the three characters gave Debussy an opportunity to create the "constant becoming" of Bergson's duration on the level of form. Interestingly, both Imberty and Dufourt refer to the evolution of music in the second-half of the twentieth century in remarkably similar terms: "forms entirely based on fluid relationships of textures and timbres". For spectral composers as for Debussy, there were formal consequences to this focus on sound as timbre. For Murail, this meant attempting to create an equivalence between the construction of sounds and musical form. In this context, Dufourt notes, they realized that time is that which "organizes form". The problem thus posed for Debussy and the spectralists was similar.

(14) In 1901 Debussy (1971, p. 240) also commented, "Music and poetry are the only two arts that move in space".

(15) Paul Dukas (1948, p. 591) commented similarly that "Debussy seeks to notate a series of sensations more than the deductions of a musical thought".

Creating differences in kind

Deleuze explains that Bergson's obsession with pure presences goes back to his call for the restoration of differences in kind and that only tendencies differ in kind. "The composite", Deleuze writes, (and any form aspiring to express the flow of duration, I propose), "must therefore be divided according to the qualitative and qualified tendencies, that is, [...] the direction of movements" (Deleuze, 1991, p. 22). In his *Creative Evolution*, Bergson explains how such a creative process begins:

> From our first glance at the world, before even we discern shapes in it, we distinguish qualities. One colour follows another colour, one sound another sound, one tension another tension. Each of these qualities, taken separately, exists until another replaces it; each can be reduced to an enormous number of elementary movements [...]. The permanence of a perceptible quality consists in the repetition of movements [...]. The principal function of perception is condensation, in other words, the grasping of elementary changes as a quality or a simple state [...]. In short, qualities of matter are stable views we take of what is essentially unstable [...]. When the successive images do not differ from one another too much, we consider them all to be the expansion and contraction of a single mean image, or the distortion of this image in different ways. And it is to this mean that we refer when we speak of the *essence* of a thing, or the thing itself (Bergson, 1970, pp. 749-750).

These words could be used to explain why Debussy, before he could draw attention to a form made of differences in kind, first had to create a distinct quality of sound and directional tendency for each section of *Jeux*. He does this with a short, clearly recognizable motive that is flexible and easy to manipulate, whose quantitative aspects — its metric, melodic, and even harmonic shape — he fixes. He then plays with it in different instrumental, registral, dynamic, and rhythmic contexts. The rhythms of statements of this same motive structure and shape time. The function of each section is not to develop or transform an idea or to flesh out part of a formal scheme, but rather to use these building blocks to create a certain "essence", its quality.

If Jankélévitch was frustrated with this turning-in-place, the post-war generation admired the extent to which compositional and orchestral processes were interdependent in such works. Boulez points to the "*orchestre-invention*" and how Debussy's use of timbre modifies "*l'écriture*", even if he situates this as a logical consequence to work done in *La mer* and *Images* (Boulez, 1966, p. 344). What has been less recognized is the debt owed by Steve Reich and his process pieces to this important aspect of musical Bergsonism, not to speak of the spectralists who likewise slow down time and dilate the moment in order to open the possibility of composing a certain quality of sound and time. For the spectralists, as for Debussy, timbre refers to the distinct quality of sound characterizing an entire section of music and involves a dynamic process. In this sense, timbre helps create structure rather than merely articulating it.

The saturation of this kind of quality causes interruption by whatever follows to come as a surprise. The first two sections of *Jeux* provide ample evidence of this. Measures 1-8 have three sound-levels: descending whole-tone harmonies in the winds, a pedal in the violins and violas, and an accompaniment pattern of two rising semitones in the horns, harp, and celesta. In mm. 9-42, the chromaticism latent in the first section's accompaniment pattern comes into the foreground, replacing the whole-tone harmonies. The basses enter for the first time, and the melodic line switches from the winds to the strings.

Just as timbral differentiation between adjacent sections characterizes all of *Jeux*, so does temporal and rhythmic differentiation. Along with the sound metamorphosis between sections 1 and 2, there is a shift of tempo from slow to scherzando, duple to triple meter, and half notes to quick staccato sixteenth notes. Each section also develops its own vector, or what Bergson might call "tendency", a force with shape and direction. By looking to the kind of tension that each moment creates, either by the saturation of one quality or the eventual disintegration of its rhythmic patterns, one can begin to have a sense of the kind of music that comes next. The anticipation aroused by this music is not one of what will recur — what melody or harmony — but a sense of what quality of sound and rhythm will provide counterbalance. For example, after an insistently descending line (around rehearsal number *8*) comes a rising one; after ambiguous motion or a turning in place (*9*) comes defined movement; after the tension of being pulled in many directions at once (*14-16*) comes resolution by unidirectional movement; after a static turning (*21*), there follows an expansive melody; periods of whispering alternate with those with full, lavish orchestral sound, and so on. This succession of impulses and tensions — which can be conjunct or disjunct — keeps the form fluid. Balance or equilibrium is constantly being recreated. The contingency of the formal unfolding — like "the free play of sound" which Debussy called "arabesque" — depends on the conditions of the moment, and these are always changing, sometimes in response to the scenario. Not conceivable then in the spatial terms of geometry or architecture, this form is a process in flux.

Even if its sections, as Jonathan Kramer has pointed out, are "as often in motion towards other sections as they are static," Darmstadt composers such as Stockhausen and Boulez looked to *Jeux* as a predecessor, a source of their "moment forms". (See Stockhausen, 1963; Boulez, 1956; Kramer, 1978) And because it "incites the perceiver to change his perspective continually to see the work under constantly new points of view, as an object in perpetual transformation", *Jeux* also anticipated the open forms of the 1960s (Eco, 1965, p. 20; Barraqué, 1988). In their shared focus on a qualitative approach to sound and the elasticity of time, spectralists too can look to *Jeux* for resonance with their concerns. Like Debussy, they consider becoming [*devenir*] as the nature of reality. Seeing music likewise as the organization of "tensions" moving in waves of contraction and expansion (Grisey) and involving a

"network of interactions" (Dufourt), they focus on a continuum of transformations. Time converts structures into processes and process, as Grisey explains, manages the mutation of sound figures, leading to the endless creation of new ones.

Similar to what Grisey began to explore in the late 1980s, *Jeux* also embodies simultaneities within the flux of duration. In attempting to explain how music can express the unconscious aspects of our sensitivity, Julian Benda suggests that, as early as *Pelléas*, Debussy chose emotions that could be expressed simultaneously, for this simultaneity would involve a process distinct from the developmental processes associated with intellectual phenomena. He also notes that it is by the "combination of sounds and timbres" that his orchestra translates the "coexistence of *mouvements sensitifs*" (Benda, 1902). Later, in *Jeux*, Debussy works with contrasting qualities of sound and time inspired by the three characters on stage. Two types of timbre — clearly defined melodic lines in the strings and trills, tremoli and glissandi in the winds and harp — differentiate the young man from the girls, while three metric areas — 3/4, 3/8, and 2/4 — carefully delineate the three individuals. In the middle of the ballet, the successive contrasting qualities do not function strictly to balance one another, but rather embody in music the interactions between these characters as each tries to persuade the other to dance and they engage in three *pas de deux*. Abrupt shifts mirroring their dialogue cause a fascinating dissonance between what one perceives, the new quality, and what one conceives, the expected continuation of the previous quality — perhaps foreshadowing the "widening gap between what is perceived and what is conceived" in Grisey's later music. Occasionally there is also what Barraqué has called "alternative continuity", connections between fragments that do not immediately succeed one another (Barraqué, 1962, 1994, p. 214). In the final *pas de trois*, Debussy forges a remarkable synthesis of these opposing meters and rhythmic patterns using duple (2/4), triple (3/8) and hemiola (3/4) patterns in ever-changing relationships from figure to ground and from successive juxtaposition to simultaneity. At the climatic "triple kiss" comes their ultimate reconciliation.

In his *Le temps et l'écume* (1988-1989), Grisey likewise works with three kinds of time — slow, compressed, and normal. As in *Jeux*, they are contrasted, involving both smooth transitions and abrupt shifts, and superimposed. In *Dans l'esprit des dunes* (1993-94), as Imberty and Capogreco point out, Murail also attempts a synthesis between the "absolute continuity of sound" and the discontinuity associated with discursive forms. Such works thus hark back to the dialectic between discontinuity and continuity characteristic of Debussy's late music.

Apprehending real time: the "mysterious link"

Debussy's criticism and correspondence suggest that the composer did not consider formal mobility and underlying continuity to be mutually exclusive. Analyzing Mussorgsky's song cycle, *The Nursery*, in 1901, he praised the composer not only for using a form that he found "quite multiple", but also for connecting this "succession of little strokes" by a "mysterious link" (Debussy, 1971, p. 29). Debussy returned to

this idea of a link in a letter of 1914 to Gabriel Pierné just after the latter had conducted *Jeux* for the first time in concert: "It seems to me that the different episodes lacked homogeneity. The link that connects them may be subtle, but it exists, doesn't it? You know it as well as I"[16].

Indeed, as Imberty and Capogreco remark, duration must have continuity as well as what they, with Deleuze, call differentiation: differentiation because of the unpredictable newsness of the creative process and continuity because of the nature of the inner life (Deleuze, 1991, p. 38). Continuity arises from interpenetration, crucial to the experience of duration, and this is the interpenetration of perception and recollection (Deleuze, 1991, pp. 26, 60). This means that qualitative change involves continuity of the past in the present.

Despite the apparent discontinuity of its sections with their differentiated qualities, in *Jeux* the past can also be said to "melt into and permeate" each present moment. Between most sections, there is some element that subtly continues from one to the next, whether a pitch or pitch-class, a motive, a rhythm, a mode, a harmony, or an articulation. The discontinuity is thus often bridged. Moreover, from one section to the next, new motives spin out in a chain-like manner, recurring, dividing, and recombining, as do certain timbres, meters, and rhythmic patterns. Only one motive keeps its identity throughout the piece even as its role vacillates throughout between figure and ground. Its return signals a process Deleuze explains as "psychic repetition", a "virtual coexistence" that takes place at moments in which new ideas are engendered out of older ones (Deleuze, 1991, p. 60).

Still, Debussy's comment that the episodes of *Jeux* are homogeneous is puzzling. In 1905, Husserl argued that one perceives the homogeneity of a multitude of "temporal shadings" through the "unity of temporal apprehension" (Husserl, 1964, p. 119). From this perspective, I have argued, we should examine temporal continuity in *Jeux*. While neither denying the fluctuating meter and tempo indications nor the ever-changing qualities of sound and time discussed above, Debussy was signalling the necessity for a common pulse or eighth note throughout the piece[17]. Obviously given the amount of rubato indicated, this pulse or beat is not rigid, but rather like that of a heartbeat, accelerating or decelerating depending on the context. This kind of temporal continuity mitigates the rhythmic tension between the triple and duple divisions at all levels of the music and holds together sections that contrast and pull apart in other ways. It is through time that Debussy implicitly expects the listener to take an active role in perceiving the continuity within the music's discontinuity.

As I noted earlier, the spectralists have long been interested in the pulse inherent in timbral change. What is new in more recent spectral music is a return of other kinds of continuity. If Grisey, until his late works, embraced the notion that

(16) Letter to Pierné printed in the catalogue of the exhibition (1962), *Claude Debussy*. Paris: Bibliothèque Nationale, p. 67.

(17) I explain this in my "*Jeux*: Playing with Time and Form", p. 71.

consciousness of change is a continuous process not involving repetition, his younger successors have found ways to use repetition of motives, rhythms, and musical situations even within long linear processes (Hurel, 2001).

IV.
Matter and timbre

Dufourt has recently posed an important question: do the polemics about timbre imply a change in the essence of art? In his article "Matter and Timbre," published in France in 1921, the Italian composer Alfredo Casella addressed this issue. Taking into account the insights of Bergson and pointing to the importance given to timbre by Debussy, Stravinsky, and Schoenberg, Casella not only argued that a revolution in musical perception had already taken place, but also proposed a "hypothesis" about the future. "From my perspective", he writes, "the musical evolution of the last decades has been dominated especially by one essential and fundamental development whose importance cannot be exaggerated: the arrival of the fourth element of sound [...] 'timbre' or 'the sense of sound colour'" (Casella, 1921). Whereas this element used to serve a subsidiary role in music, it is now in a predominant position in aesthetics and contemporary technique. While the "numerical relationships" of pitch (melody and harmony) or duration (rhythm) are "merely quantitative," timbre offers the possibility for "qualitative" relationships. Casella points out that such a concept, although new in Europe, has long existed in the Far-East. What is essential in Asian music is "the sense of matter"[18]. More than melody or rhythm, he hears their music as "exploiting the resources of substance". Endorsing this evolution in Western musical perception from the "purely quantitative" to the "qualitative", Casella envisages composition based on matter as the primordial element. He imagines one day that "a single chord could contain in its 'simultaneity' a sum total of the sensation and emotion equal to that which unfolds today in the 'duration' of this or that other musical fragment".

> It is not fanciful to imagine, even today, a music which is free of rhythm (an element which is not in the least musical), liberated from all trace of counterpoint in which groups of sounds only obey the fantasy of the creator and the necessity to achieve "different colorations", a music that would be "melodic" not in the still primitive sense which we attribute to this word, but in the much larger sense of any coordinated succession of sonorities in time (Casella, 1921, p. 42).

Casella was clairvoyant. So was Varèse, who envisaged an electronic music that would allow him to write music that was not an "interplay of melodies", but rather

(18) Already in 1872 some French believed that in Asia, music is basically "only the glorification of sound in matter and in nervous impressions". See "La vie publique et privée des castes musicales", *Revue et gazette musicale* (25 August 1872), p. 267.

a "melodic totality", music that "flows as a river flows" (Varèse, 1966, pp. 11-16). As Dufourt points out, Jean-Claude Risset has now shown how sounds can be composed like chords, and in 1969 he proposed a music based on relationships of timbre rather than pitch. For Grisey too, it has been critical to get away from counterpoint, to write "antipolyphonic" music. What his predecessors could not have predicted, however, was what we've learned from computer musicians and psychoacousticians about the nature of a sonority — its unstable equilibrium, the "singularity of instrumental timbres" coming from the anomalies and accidents involved in the attack and waning of the sound wave that make up its microscopic morphology. Still, from Dufourt's perspective, spectral music is not just "a kind of abandonment to the increasing domination of matter that would find its ultimate sanction in the factitious objectivity of the thing for its own sake". Spectral composers have certainly redefined musical matter as an ensemble of parts with reciprocal implications. But who could have imagined the "hybrid" sounds, neither timbres nor chords, with which they are now working?[19]

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• References

Aimel, G. (1910). Une heure chez H. Bergson (*Paris-Journal*, 11 December 1910). In H. Bergson (1972), *Mélanges* (p. 844). Paris: Presses Universitaires de France.

Anderson, J. (2001). Entry: Gérard Grisey. In Stanley Sadie and John Tyrrell (eds), *The New Grove Dictionary of Music and Musicians* [2nd ed.] (vol. 10, pp. 428-29). London: Macmillan.

Bailly, E. (1889). Le Monde sonore, *La musique des familles* (31 August 1889 to 5 October 1889).

Barraqué, J. (1962; 1994). *Debussy*. Paris: Seuil.

Barraqué, J. (1988). *La mer* de Debussy, ou la naissance des formes ouvertes. *Analyse musicale, 12*, 15-62.

Benda, J. (1902). A propos de *Pelléas et Mélisande*. *Revue blanche* (1 July).

Benda, J. (1912). *Le bergsonisme ou une philosophie de la mobilité*. Paris: Mercure de France.

Bergson, H. (1910). *Essai sur les données immédiates de la conscience*. Paris (1889). Trans. by F.L. Pogson as: *Time and Free Will*. New York: Allen.

Bergson, H. (1970). *Oeuvres complètes*. Paris: Presses Universitaires de France.

Boulez, P. (1956). Debussy. *Gravesaner Blätter, III/III*, 5.

Boulez, P. (1966). *Relevés d'apprenti*. Paris: Seuil.

Casella, A. (1921). Matière et timbre. *Revue musicale* (1 April), 39-43.

Debussy, C. (1927). *Lettres à son Éditeur*. Paris: Durand.

Debussy, C. (1971). *Monsieur Croche et autres écrits*. Paris: Gallimard.

Deleuze, G. (1991). *Le Bergsonisme* (1966). Trans. by H. Tomlinson and B. Habberjam as: *Bergsonism*. New York: Zone.

Dukas, P. (1948). *Ecrits sur la musique*. Paris: Société d'éditions françaises.

Eco, U. (1965). *L'Oeuvre ouverte*. Paris: Seuil.

Gervais, F. (1958). La notion d'arabesque chez Debussy. *Revue musicale, 241*, 3-22.

Grisey, G. (2000). La musique: le devenir des sons, as cited in Dufourt in this issue.

Hurel, P. (2001). Spectral music: long term perspectives. Liner notes in the Kairos recording of Grisey's *Quatre chants pour franchir le seuil*. Klangforum Wien conducted by Sylvain Cambreling.

Husserl, E. (1964). *The Phenomenology of Internal Time-consciousness*. Bloomington: Indiana University Press. (First published as *Vorlesungen zur Phänomenologie des inneren Zeitbewusstseins* from a series of lectures, 1904-1910). Trans. J.S. Churchill.

Jankélévitch, V. (1976). *Debussy et le mystère de l'instant*. Paris: Plon.

Kramer, J. (1978). Moment Form in Twentieth-Century Music. *Musical Quarterly, 64*(April), 177-94.

Laloy, L. (1914). La musique chez soi. M. Henri Bergson et la musique. *Comoedia* (February-March).

Orden, K. van (2002). Descartes on Musical Training and the Body. In Linda Austern (ed.), *Music, Sensation, and Sensuality*. New York: Routledge.

Pasler, J. (1982). *Jeux*: Playing with Time and Form. *19th-Century Music* (Summer), 60-75.

Pasler, J. (2001). Entry: Impressionism. In Stanley Sadie and John Tyrrell (eds), *The New Grove Dictionary of Music and Musicians* [2nd ed.]. London: Macmillan.

Shattuck, R. (1955). *The Banquet Years*. New York: Vintage.

Stockhausen, K. (1963). Von Webern zu Debussy. Bemerkungen zur statistischen Form. *Texte zur electronischen und instrumentalen Musik*. Cologne: Dumont Schauberg, vol. I, 75-85.

Varèse, E. (1966). The Liberation of Sound. *Perspectives of New Music* (Fall/Winter), 11-19.

Vuillermoz, E. (1899). L'impressionisme en musique. *Revue jeune, 2*, No. 24-25 (10-25 July), 1-6.