

The open universe

Programming new and innovative music is still a big stumbling block on the established concert stages. In many programme notes it is not unusual to ridicule audiences of the past whose lack of appreciation for the great masters of their time seems to us, who have the benefit of hindsight, incomprehensible. As if the music of our own time is better understood and composers today are in full engagement with their enlightened audiences. Nothing could be further from the truth and a depressing lack of understanding of the achievements of the twentieth century's avant garde still succeeds in stifling courageous initiatives in their birth. It has cleared the way for monsters such as Classic FM to corrupt the market by downgrading the 'popular classics' into soporifics and grinding all its spine into narcotics.

It would be unthinkable in a healthy, open cultural climate that experimenting were to be stopped. It seems therefore timely to review once more the developments that took place during the last century, looking at the various styles and methods of composition, culminating in the last fifty years or so. To better understand these we can put them in the wider context of the revolutionary changes that took place in that century and radically widened the horizon of our knowledge and aspirations.

In the course of the previous century conventions and barriers which previously kept hierarchic power structures intact in the western world, were pushed aside in bulk. Secularisation percolated through to ever larger groups of society at grinding speed and forced them to look around for substitutes of old truths and to discover the forces that control our lives for themselves. Developments in technology and mechanisation followed each other in ever faster succession and provided the sciences with the tools to investigate phenomena and natural processes from the subatomic to the cosmic. The march and popularisation of global communication and transport systems brought knowledge from many disciplines within reach of more and more people. As a consequence the ground for democratic aspirations expanded and the removal of autocratic structures became inevitable. Command and commandment were to be replaced by dialogue and discussion; war and conflict by diplomacy and the rule of law; oppression by rights and duties; nationalism by internationalism and globalisation. Access to education was to ensure the demise of indoctrination.

Sharing technology and knowledge opened the way for the emergence of theories such as relativity and quantum mechanics, expanded our knowledge in practically every field beyond all recognition and brought about correlations unthinkable in the old days. New dimensions and numerous refinements had to be adopted in the description of phenomena. From now on we live in a multidimensional universe in which complexity of interdependences have become the measure of human thought.

It should come as no surprise that the musical world was going to be affected by all the turbulence and started to explore new territory in spite of the almost unshakable traditions and conventions that keep it in harness. But during the fifties and sixties the fences came down temporarily and a number of audacious adventurers were able to march with

impunity through the porcelain cabinet. In the Netherlands the Provo movement intoned the first confrontations with the established order whose foundations were thoroughly shaken with ever coarser artillery, albeit mostly in carnivalesque stage settings. Amsterdam was at the forefront but followed Paris with actions such as the Nutcrackers¹.

To understand what influence these developments had on the imagination of the composer we can now enter the musical universe as a metaphore and put all the dimensions of its *space*, which were reformulated in various ways by the pioneers of innovation, under the microscope. We can file past certain trends that were already in evidence before that notorious and revolutionary era in broad outlines. Because towards the end of the nineteenth century an increasing desire to break out of the limitations of classical precepts was palpable and the exploration of new territory became almost a goal in itself.

The avant-garde of the nineteenth century.

Breaking out of **tonality** through increasing use of chromatism, provided an incentive to look for alternative systems of tonal control. Mention Wagner and Liszt for instance, and follow the trail via Franck and Fauré ('toujours moduler'), via Debussy, Ravel, Moussorgsky, Skrjabin etc. (whole tone, modal and free tonal to almost a-tonal systems with many timbre enhancing 'notes ajoutées') to Stravinsky's bitonal and frankly a-tonal harmonies in the Rite of Spring (1911!).

Say Wagner again and follow another trail to the early works of Schoenberg, Berg and Webern (avoid tonal centre of gravity and discover that what you do is: constantly mobilising all twelve tones in the octave). The latter followed this through in all its naked consequences, not unlike Mondriaan did in his paintings. These paradigmatic experiments had already been conducted well before WW II.

In the **rhythm** department a similar expansion took place. Metric patterns gave way to freer, if not entirely new systems. Accelerandos and ritardandos, bar and speed changes, rhythmic ornamentation and anti-metric rhythms began to interfere with and enrich the metric skeleton. Both tonal and rhythmic innovations affected the structure of a composition. Classical models of **form** had to make room for a freer architecture, for which often literary or other extraneous sources were called upon as guiding principle (such as in operas and the symphonic poem).

Colour, timbre, dynamics, articulation...sound

Not only in orchestral music but also in solo and chamber works a trend emerges for an ever more refined use of instrumental combinations, unusual ways of playing and dynamic effects. Tsjaikovsky, Korsakov, Moussorgsky, Skrjabin, Berlioz, Dukas, Debussy, Ravel, Mahler, Strauss, Liszt, Wagner, Sibelius etc. introduced worlds of sound in which at first an interest in 'sound as effect' appears which would later evolve into 'sound as building block'. The sound worlds Anton Webern conjured up at the beginning of the new century can almost be called sound sculptures.

¹ The 'Notenkrakers' were a movement of musicians in the spirit of the student revolts that preceded them.

Inspiration was found in nature, in literature, in the visual arts, a whole gamut of extra musical sources was called upon. Also an interest in folklore and non-western music became on many levels an inspiration to explore new roads, up to adopting new instruments. For instance the percussion section was subject to an increase which eventually would grow into the biggest arsenal of sound kit orchestras ever assembled.

No room is available here to show how individual parameters can yield ambivalent (or polyvalent) parameters besides, such as harmonies which become colour and capable of fulfilling new functions in conjunction with specific articulations. Very complex situations can be entered along those lines and for an interesting study which tries to formalise the intricacies of this approach I can refer to a PHD script by Jos Kunstⁱⁱⁱ.

The avant-garde of the twentieth century

Debussy en Stravinsky can be seen both as bridges to and architects of new territory. They usher in a new era from which composers such as Varèse, Bartók and Messiaen rose to prominence. The *Rite of Spring* (1911) and *La Mer* (1905) or even *Prélude à l'Après Midi d'un Faune* (1894) are not only culmination of achievements but also catalysts of innovation, or even provocation. Preoccupation with the creation of these totally new sound worlds didn't in any way diminish attention to detail in all other aspects of the music. Indeed, a virtuoso integration of musical ingredients (in the departments of rhythm, melody, harmony, dynamics, instrumentation, and what not) opened the doors to undreamt of perspectives.

Varèse showed what kind of perspectives the innovative and provocative route entailed. Although various elements in *Amériques* (1922) and *Arcana* (1927) still show traces of the past, the overall tendency is a radical departure to new musical concepts on every level: rhythm, melody, harmony, instrumentation, architecture – they all break new ground. The musical result requires a totally different focus of attention because musical drama is no longer the result of conventional phrasings of tension/relief, but much more like manifestations of natural events which have torn themselves away from the composer. Contrast and change are the norm and unpredictability makes its entry. Varèse's later preoccupations with electronic means of sound production show how far he wanted to venture into the boundless space of the sound universe that occupied his imagination^{iv}.

Webern's oeuvre however, more than that of Schoenberg, leaned towards 'system', that could be analysed to the bone and developed to its extreme consequences. An impressive procession of twelve-tone and (later) serialist disciples discovered in that approach a new anchorage for their experiments: Boulez, Stockhausen, Berio, Ligety, Nono were among

ⁱⁱⁱ Jos Kunst – *Making sense in music: an enquiry into the formal pragmatics of art*. Ghent: Communication & cognition, 1978. Also published as publication, University of Utrecht.

^{iv} Jan Vriend – *Een Hypothese vanuit Stilstand - (the stillpoint hypothesis)*. Essay about the music of Edgard Varèse in: *De Bevrijding van de Klank*, ASKO Amsterdam, 1984.

the first to climb the Parnassus where for a couple of decades the organisational principles for countless compositions were formulated, although almost all of them, in their later works, turned to much freer and personal methods of composition. The 'impersonal' or abstract character of many works of the serialist schools can be compared with those of the old polyphonists (Machault, Obrecht, Ockeghem, Taverner, Palestrina etc.) who were often referred to as model composers for their approach. But also interest in the practice of Indian music brought this principle to the fore: the composer retreats into the background (Ton de Leeuw). It is true that the need for rules and procedures to guarantee coherence and unity of conception led in many cases to rules and procedures which served to justify musical products. Many a programme note, 'scientific' publication or education book of the day bears witness to this trend.

John Cage, who initially trained with Cowell and Schoenberg, started his career innocently enough with work based on simple constructivist principles of form, especially on a rhythmic level and partly inspired by Balinese music. It didn't take long before he developed his controversial views on music and musicianship, which eventually were to brand his trademark. His further exploits into Zen-Buddhism drew him to the very margins of musical practice where, in its most extreme form, the principle emerged of "everything is possible; everything is allowed". Every sound source is acceptable and every manipulation of sound is music, even 'composed' silence in which one hears unprovoked sounds such as the hiss of one's own blood circulation, the coughing of someone in the audience, a tram that passes, the rain clattering on the roof...

His influence stretched over the continents and brought forth a new genre of composers who temporarily managed to offer respectable status to anarchy and provocation. All frontiers had to be trespassed. The score, where it was still in use, turned into graphic art whose interpretation was left to the fantasy of the 'liberated' performer. On balance Cage has, in this way, unlocked territory which, in terms of this essay, have radically opened up musical space.

Xenakis occupies a unique position, both with his music and his theoretical endeavours to formalise the totality of the open sound universe. The first mathematical models he called upon were a means to replace the bizarre relationship between technique and result in serialist music with an approach which had a direct bearing on the result. For on paper he saw polyphonic layering and impressive transformations of serial material; what we could hear in his opinion sounded much more in terms of 'mass', 'density' and 'texture' – indeterminate organisation of sound particles, in other words aspects of a statistical and probabilistic nature.

Xenakis proposed to take the bull directly by the horns and to use means that were the most appropriate to obtain the desired results in the new sound world. In his own compositions that approach was underlined in a number of impressive triumphs (Metastasis, Eonta, Kraanerg, Syrmos, Anaktoria...). His interest in natural processes, technology and science that bore a relationship to this problem, led him to try his hand at various approaches for an adequate formalisation and urged him on to explore the outer regions of his sound world, in the course of which the instrumental skills of the musicians (and the ears of his audiences) were tested to the limits. The entire spectrum of sound was for him the composer's natural

habitat and any manipulation of it required adequate control, for which he found the tools in mathematics and related disciplines.

New instruments, electronics and percussion.

The addition and development of new instruments, including electronic sound production, made it necessary to reformulate concepts like pitch, harmony and colour/timbre.

Dissonance/consonance, harmonic progression, melody and counterpoint acquired new meanings and had to be handled in accordance with the nature of their instruments or sound sources in order to find a way to integrate them in a musical context and make sense.

On balance

Musical space can be viewed as a multi-dimensional *vector* space. A number of key dimensions can be defined separately as *variables* which in turn relate to one another in various degrees of interdependence.

Each composition unfolds the dimensions of its own space by the way it 'activates' them and their interdependence. An aspect of a space becomes a living *dimension* when it undergoes changes in complete or part independence of other dimensions. Or, in more mathematical terms: if within its domain it can assume different values in relative independence. Example: in a hypothetical piece of music pitch can change whilst simultaneously loudness, more or less independent from the behaviour of the pitches, can follow its own pattern. If they are related e.g. the higher the pitch the louder the note, they become one. In other words, the degree of interdependence between variables such as pitch, loudness, colour, texture, density etc. can result in effects that in their totality produce new phenomena.

Twentieth century developments have completely thrown open the doors of musical space and we are now able to distinguish their properties.

Rhythm. The *axis* on which rhythmic progression of music of the past can be represented, consists mainly of discrete steps (roughly whole numbers) grouped in binary or ternary subdivisions. Periodicity, first and higher order, was the norm. When triplets were introduced and other so called anti-metric patterns arrived on the scene, subdivisions became more complicated and when superpositions of anti-metric patterns started to appear in ever increasing numbers, a degree of complexity was reached which the human ear could only perceive as fluctuations of 'density' and 'irregularity': periodicity becomes a-periodicity.

On the rhythmic axis the pulses of events then look like irregular successions. These in turn can betray certain patterns and their description may become the object of research, such as in chaos theories: all sorts of 'distributions' are distinguished which are applied in the study of both natural and artificial processes and phenomena. Everybody is familiar with processes and phenomena which show irregularity, also in the acoustic world that we inhabit: the crackle of fireworks, the spatter of rain, the noise in a factory, the chatter in a

warehouse, the song of birds, the noise of traffic, the rhythm of speech, the list is endless. In extreme cases we perceive a continuum – absence of impulses – which found ample application in electronic music.

In short then, the rhythm axis, the rhythmic dimension, is 'open' and access to an unlimited choice of control principles for rhythmic organisation is thrown wide open. Concepts such as regular/irregular, periodic/a-periodic, chaotic/ordered, dense and open, complex and simple, synchronous and a-synchronous, can become tools in the design of musically meaningful structures.

Speed. It is important to distinguish speed from rhythm because they can be treated completely independently. Each rhythm can be executed at different speeds, can be accelerated and decelerated, gradually or abruptly, and change character altogether in the process. The speed dimension is, in other words, a variable continuum that leaves a great margin to play with and to control the elasticity of the musical space in question.

Pitch. Where diatonic music was based on characteristic (and since Bach artificially tempered) subdivisions of the audible spectrum, chromatism filled in the unused spaces on the axis of pitch. But with increasing interest in deviations from the well-tempered scales, such as we find in music of other cultures, notably where instruments allow for other intonations and intervals, or where pitch is indeterminate, it became necessary to conceive of a much more flexible look at this tightly ordered dimension. Quarter tones and other micro-intervals forced composers to invent musically relevant methods to control the pitch dimension. Electronic music went much further and basically swept the floor off any restriction that stood in its way. In instrumental music glissandos and other pitch inflexions were adopted. And behold: the pitch dimension has become another perfect continuum, from the lowest audible frequencies to the highest.

'High' however is still high, and low still low. Intervals are still relationships between frequencies and their characteristic proportions cannot be ignored in new settings. Chords can still be strung together as harmonies in meaningful progressions of tension/relief, affinity/contrast, dissonance/consonance. Degrees of consonance (or dissonance) have become a measurable quantity. In music for instruments of indeterminate pitch the composer has to apply appropriate definitions if he wants to make the pitch dimension 'operational'. In extreme cases this may be impossible and the dimension remains rudimentary.

Various ways are available to 'organise' the pitch dimension and various systems can be usefully applied. Everything depends on the inventivity and knowledge of the composer who tries to find appropriate means for each purpose. *Range* and *register* can also find a place in these considerations and contribute to the enrichment and deepening of musical space.

Dynamics, volume, intensity.

It is fairly easy now, having arrived at this point, to imagine the dynamic axis as a perfect continuum between the two extremes of loudness. This dimension can therefore be

manipulated with fluctuations from gradual to abrupt and, in doing so, develop into a full-bodied musical parameter in the total expansion of musical space. The dynamic 'envelope' made its entry and can reach degrees of complexity which lands it sometimes onto the margins of articulation (see below).

Viscosity.

The concept of viscosity is useful to indicate all the variations between legato (including overlaps) and staccato. Active use of the numerous distinctions that can be made, opens up another dimension to articulate the transparency of the space.

Colour, timbre, articulation.

Not only the introduction of new sound sources but also the expansion of the sound spectrum on traditional instruments by means of a variety of playing techniques, have developed the colour-dimension into a spectacular reservoir of raw material for new music. It is henceforth paramount to remember that sound is THE building block of music. And more: that any sound can be turned into music if the composer is able to design an adequate musical syntax for it. What makes sound musical, when do manipulations of sound become music, is a study in itself – impossible to muse upon in a few words. The emphasis on the sound aspect is important because so many musicians still believe it is the 'notes' that matter. They matter in as much as they guide the raw material which they 'represent' into living configurations of sound.

Melody or (linear) curvature.

The borders between melody and pitch sequencing can be vague in this new universe. The concept of melody is ambivalent and depends on its musical context. In particular when sounds don't have unambiguous pitch characteristics, the design of 'melody' or melodic lines (curves) leads to unorthodox solutions, inspired by the nature of the sounds in question.

The domain of possibilities to approach the concept of melody is vast, but can be made manageable if one settles for a number of archetypes which every composer can mould to his own requirements.

Conclusion

The open universe is here to stay. The million dollar question is now what future it has and why it should make sense not to give up our interest in its further exploration. It is not difficult to see why continually regurgitating succes formulas of the past cannot be a positive element of a living culture. It paralyses curiosity and ignores that the quality of the old and familiar is relative and that it was once new too. When Beethoven's third symphony sounded for the first time, it had the quality of an eye-opener. For many people it has now become 'confirmation' of so called higher values and association with it a status symbol.

A work of art, a piece of music, is at best a model of a reality in which the human spirit finds its manifestation on various levels of consciousness. The composer can engage in problems of great complexity and exploit the difficulties he encounters as if they were creative incentives. Or he can dodge them and go the easy way of the trodden paths. Even

if entertainment was the highest goal of music, the problem is still colossal and subject to a highly developed sense for the psychology of the listener. Both a composer's cleverness, talent or even genius and his laziness or opportunism reveal themselves in manifestations of flesh and blood, i.e. of audible and definable sound constructions.

It is of vital importance to understand that further explorations of the open universe provide the soil from which new music must grow, without expecting every new work to be a masterpiece. This realisation forms the basis of visionary culture policies. Adventure and experiment are thus the visiting card of a healthy, creative, critical and therefore living culture. And who mentions adventure and experiment mentions risk. To fail and err are an inherent part of the learning process. The composer too takes a considerable risk as soon as he enters new territory and he needs a climate in which his efforts get a chance to be tested and if necessary fail, in order that he can *learn*. The beauty of art is that it doesn't have to be utilitarian. But it is a formidable testing ground for the human mind to experiment unhindered with forms of communication by means of emotional, sensual and intellectual stimulants which either challenge or send us to sleep...

No less important then is that the public i.e. consumer and tax payer/sponsor, is party to the developments. For the listener can be inspired to much more than just consume and enjoy: he can also be drawn into the composition and thought processes of the creator the more he is able to connect with the multitude of options and decisions, levels and ambiguities, details and correlations. In that way a critical spirit evolves and the musician emancipates *with* the listener. Given that communication is the ultimate goal of music, testing that communication is an essential part of the creative process. That way the knife cuts at both ends – an audience doesn't have to be passive. Art is not only consumed, it is lived.

Concert programmers and concert organisations have failed to exploit here a formidable opportunity. It is arrogance to suppose 'the man in the street' with an open mind is unable to face a confrontation with the newest music and to develop an active interest for it. Lack of understanding of the way music works and affects, combined with a poor understanding of the open universe, have undermined this potential and, in doing so, cut off a path to active involvement in the exploration of that enormous terrain which stretches out in front of us. They have also encouraged many a composer to give in to the opportunistic temptations of market forces.

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